Monthly Bulletin
December 1971

Madras Development Seminar
Special Number

Vol. I No. 11

Madras Institute of Development Studies
74, Second Main Road,
GANDHINAGAR, ADYAR, MADRAS-20.

MONTHLY BULLETIN

Vol. I No. ~~10~~ 11

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EDITORIAL — SOME HIGH LIGHTS.

General Economic Scene :

International : The general economic scene—international, national and state—continues to be sombre as reviewed in the last issue of the Bulletin No. 10. The review of the Secretary-General of the United Nations and that of the President of the International Bank for Reconstruction and Development of the first year of the Second Development Decade highlights the slow down in the rate of growth of both developed and developing countries, the reduced share of the latter in the volume of world trade, and the growing trend to decide on the reform of the international monetary system without the initial and full participation of the third world. The Lima Declaration of the 95 developing countries calls for a rapid transformation of the world economic order in order to meet the needs of the poor countries and this call must be quickly and effectively met, if the small economic growth of the sixties are not to be lost. The O E C D review shows that international aid was a trickle in the sixties—amounting to around Rs. 30 per person per year in the poor countries, the total declining from 0.36 per cent in 1969 to 0.34 per cent in 1970 of the combined GNP of the rich countries. On the other hand, the United Nations reports that the world spent $ 200 billion last year on producing arms and will be spending $ 350 billion by the end of the decade. 80 per cent of this is spent by the six richest countries. The 6.5 per cent of world GNP which was spent last year on armaments could have been invested in Development. Thus the indices of economic slow down and mismanagement—revealed in the rate of growth, world trade trends, monetary systems and financial flows—show that development is held down not by lack of resources but lack of agreement on priorities.

National: At the national level, the economic scene is equally disquieting. The impact of the price spiral will be the non-fulfilment of the physical targets and the over fulfilment of the financial targets of the plan. It is in the industrial area—in steel, fertilisers, basic metals and metal products, non-electrical machinery, transport equipment—that the slow down will involve attaining their Fourth Plan targets in the first or second year of the Fifth Plan. The financial target of Rs. 5300 crores (Rs. 3050 crores in the public and Rs. 3,250 crores in the private sectors) is likely to be realised, with a certain imbalance. While investments in the key industries such as fertilisers, iron-ore, non-ferrous metals are lagging, that in aluminium, paper and pulp, cement, commercial vehicles are surging ahead. This slow down and imbalance industrial investment and growth is serious for the economy. The continuing and satisfying improvement in agricultural performance due to four successive years of good rains and the pay off of the new agricultural technology tend to blur the fact that while increased agricultural production can sustain and feed industrial growth, it is industrial growth alone that can trigger the growth process in the economy and provide the backward and foreward linkages that contribute to a process of self-sustaining growth. The industrial stagnation of last year and the deceleration in the first nine months of this year is a set back to general future growth and development. The key to remedial action is the five point programme to arrest further price rises, proposed by the Union Planning Commission: (a) increased supplies of all goods in short supply through increased industrial and agricultural production. (b) increase in food grains buffer stocks, (c) a public distribution net work of foodgrains and wage goods. (d) price support and price stabilisation measures in important commercial crops. (e) effective monetary and credit supply controls. In this context the new taxes as of November 15 on rail and air travel, postage and trade transactions are not a direct help to the production stimulus needed. Apart from meeting to some

extent the increased costs of Bangla Desh refugees, they will reduce consumption resources by some 40 crores this year and 70 crores next year and to that extent act as an anti-inflationary instrument.

State Plan Outlay: For the State, the strategy in this national and international situation, is a double one. First it is to increase the plan outlay to the maximum possible and specifically to plan a fourth year investment and outlay pattern at a higher level than that of the third year. It is here that the resources constraint must be overcome. During the first two years of the Fourth Plan, the State spent Rs. 209 crores against the target of Rs. 180 crores. For the current year 1971-72, it is spending Rs. 116 crores against the available resources of Rs. 75 crores. For the last two years of the plan, the residual target is only Rs. 203 crores, whereas the State ought to be spending during that period Rs. 250 crores. This means that in addition to the current over-draft of Rs. 33 crores, the next two years' plan effort in the State will call for an additional Rs. 50 crores of central assistance. Such assistance would not even be matching the remarkable effort of the State in raising its own resources. In place of the plan target of Rs. 85 crores, it would be raising over Rs. 150 crores. Such an increased tempo of plan expenditures in the state will not only keep the momentum of its industrial growth, it is necessary in view of the growing problem of unemployment.

Unemployment : The unemployment situation in the State cannot as yet be fully charted. In a note presented to the eleven member Bghawati Committeee on unemployment appointed by the Government of India which held a two day meeting on October 13 and 14 in Madras, the Madras Institute of Development Studies presented the following tables and comments.

TABLE–I

EMPLOYMENT AND UNEMPLOYMENT IN TAMIL NADU.

Percentage Distribution of Population by Sex and Labour Force Status in Tamil Nadu—1960-61 & 1969-70

Labour Force	*RURAL* Male 1960-70		*RURAL* Female 1960-71		Total	*URBAN* Male 1960-70		*URBAN* Female 1960-70		Total	*STATEWISE* Male 1960-70	Female 1960-70	Total
Employed	(54.23)	57.5	(25.92)	32.7	45.4	(50.17)	47.0	(11.30)	10.5	29.1	53.3	23.9	38.9
Unemployed	(1.44)	2.4	(1.8)	0.1	1.3	(1.86)	3.0	(0.4)	1.5	2.3	2.7	0.7	1.7
Total	(55.67)	59.9	(27.72)	32.8	46.7	(52.03)	50.0	(11.73)	12.0	31.4	56.0	24.6	40.6
Outside Labour Force	(44.07)	40.1	(71.82)	67.2	53.3	(47.1)	50.0	(86.58)	88.0	68.6	44.0	75.4	59.4
Total	100		100		100	100		100		100	100	100	100

Figures in brackets are for the year 1960-61. In 1969-70, 45.4 per cent of the rural population and 29.1 per cent of the urban population (accounting from 38.9 per cent of the State population) are employed in gainful activities while 1.3 per cent of rural population and 2.3 per cent of urban population (i.e. 1.7 per cent of the State population) are unemployed. Both employment unemployment (except in urban employment) have increased in 1970 vis a vis 1960. The unemployment growth rate has been higher.

Sex-wise in rural and urban areas the incidence of unemployment among males is higher than for females. Areas wise the incidence of unemployment in urban area is higher than that for rural areas.

TABLE—II

PERCENTAGE DISTRIBUTION OF UNEMPLOYED PERSONS BY EDUCATIONAL STANDARD

	Unemployed.			Educational Standard				
	Males	Females	Total	Graduate and above	Matric	Below Matric	Illiterate	Total
Rural	9.54	4.6	100	2.6	15.8	58.6	23.0	100
Urban	67.4	32.6	100	8.6	62.3	23.4	5.7	100
State	80.4	19.6	100	5.8	40.7	39.8	13.7	100

Among the unemployed in rural areas 95.4 per cent of them are males and 4.6 per cent of them are females. Of these 2.6 per cent are graduates, 15.8 per cent matriculates, 58.6 per cent are literates below matric and the remaining 23.0 per cent are illiterates.

In urban areas 67.4 per cent of the total unemployed persons are males and 32.6 per cent females. Of these 8.6 per cent are graduates, 62.3 per cent are matriculates, 23.4 per cent are literates below matric and the remaining 5.7 per cent are illiterates.

Of the total unemployed, the matriculates occupy the highest percentage being 40.7 per cent. The incidence of unemployment among graduates in urban areas is higher than in rural areas.

TABLE—III

THE % DISTRIBUTION OF UNEMPLOYED PERSONS WITH SPECIFIED EDUCATIONAL LEVEL BY THE DURATION OF THEIR UNEMPLOYMENT ACCORDING TO THE 21ST ROUND OF THE N.S.S.

21ST ROUND

DURATION OF UNEMPLOYMENT

Educational Level	*Upto 3 months*	*3 to 6 months*	*6 to 1 year*	*1 year time*	*Not received*	*Total*
1. Illiterate	62.19	12.05	11.33	11.18	3.35	100
2. Literate below Secondary	28.33	22.28	26.38	21.24	1.77	100
3. Secondary	20.91	22.98	33.49	21.77	0.85	100
4. Graduates	26.99	29.20	22.02	19.01	2.78	100
5. Other graduates having technical education.	30.78	37.44	29.94	21.34	0.50	100
6. Total received	75.67	24.93	—	—	—	100
Total ...	32.25	20.91	25.50	19.56	17.78	100

(All the tables are based on NSS data including the latest unpublished ones)

The proportion reporting unemployment of short dimension (upto 3 months) was higher among the illiterate than among other groups. Also the proportion reporting unemployment for more than 6 months was higher among the matriculates and the graduates.

Not only is the incidence of unemployment relatively lower among the graduates than among the matriculates, the waiting period or duration of unemployment also appears to be lower for the former than for those who do not acquire a college degree.

The latest All India unemployment estimates published show a 23 per cent increase in unemployment in 1970-71. Employment has increased by 2.2 per cent in the public sector and by less than 1 per cent in the private sector. In August 1970, 3.9 million workers were looking for employment: in August 1971 there were 4.8 million job seekers. In the State and the south generally, there is stagnation in employment growth at a little over 2 per cent during 1970-71. In this increasing trend of unemployment in the State, the Director of Employment and Training reports also increasing number of job-vacancies and a short supply for certain jobs. As of 31 December 1971, these vacancies include Stenographers (491) typists, town planners, health and B.T. assistants etc., This contradiction between the demand for jobs and unfilled jobs is due to lack of labour mobility and job-market information, poor recruitment procedures and ineffective vocational guidance. The main employment bottlenecks appear in North Arcot, South Arcot,, Coimbatore, Dharmapuri and Ramanathapuram districts. In addition to effectively implementing the centrally sponsored crash employment schemes, industrial, agricultural and agro-industrial in the State which were reviewed in the May and June issues of the Bulletin (Nos. 4 and 5), the State should put into effect its programme for improving national highways and minor and feeder roads, where every Rs. one crore expenditure will employ 12,000 unemployed Tamilians. So too the intensification of the housing programme of the State with the help of the L.I.C. loan and that of the centre amounting to Rs. 2.5 crores. Housing is equally employment generating. In this regard the Chingleput Poultry unit, its wells, pump sets and link roads programme are a model. But the major cure for the growing unemployment in the State is not these ad hoc crash programmes but intensified growth which calls for the first part of State strategy-increased plan outlays.

Reduced consumption expenditure : The second part of the strategy for the State is reduction in consumption expenditures by the people and non-development expenditures by the State as suggested in the last issue of the Bulletin (No. 10). The urban land tax which went into effect in November and the agricultural income tax which ranges from 5 per cent at the lowest level to 55

per cent for incomes above Rs. 55,000 per annum on the basis of the standard acre concept are a good start. The work ng of the agricultural tax can be reviewed after two years and its stucture, rate and administration-especially with regard to tax evasions-improved and rectified. The State is equipped administratively for the adequate collection of this tax, while the Centre has no machinery for tax collection in the rural areas. The problem here is to ensure a minimum amount of uniformity as between the States, which at present is distressingly absent. The State is also one of the first to establish reductions in non-plan and non-developmental expenditures. All current budget allotments in this area are reduced by 5 per cent: all vacant posts will remain unfilled for six months: travel and telephone charges are reduced by 10 per cent: State functions are eliminated or reduced. There is need for a similar reduction in the administrative expenditures of the Central Government. These expenditures have been mounting rapidly. In addition the plea of the State government that there should be an all India policy concerning the salaries and allowances of Central and State government officers should be heeded. The current unilateral escalation of Central Government allowances have very serious effects on the finance of the State. In this State the salary bill in the Fouth Plan has had to be increased by Rs. 100 crores as a result of the Central Government's decision following the recommendations of the Central Pay Commission.

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Agricultural Trends :

Rice : Rice production trends are that current year's output will exceed that of last year's record of 53 lakh tonnes. The estimates for this year, 1971-72, vary from 54 lakh tonnes to 59 lakh tonnes. The November seasonal crop reports show that production is satisfactory throughout the State except in parts of South Arcot and Tiruchi districts. Some 38 lakh acres, which is 80 per cent of the total area under paddy cultivation has been brought under the high yielding varieties programme. These varieties which have emerged from the Coimbatore, Aduthurai, Tirurkuppam and Ambasamudram rice research centres range from such strains as GEB 24 to IR 8, 20, 22 to Karuna. The latest variety, Karuna, has been planted in one and a half lakh acres

and has an acre yield of two tonnes, while the other popular variety ADT 27 has a 1.4 tonne yield. The reports from Thanjavur, Tirunelveli and the Tambaraparni delta which reveal a satisfactory position, emphasise however how far the entire production programme is dependent on the monsoons. In all these areas the timely monsoon ensured the target production.

This continuing increase in production brings with it problems to which attention must now be given. First is the need for good management practices and intensified research. In East Thanjavur, the Kuruvai crop has been attacked by a new pest which eats into the ripe grains. In places like Thalainayar the yield of the ADT 29, which is specially subjected to this pest, has been reduced by 50 to 80 per cent. Second as the State emerges as a surplus State in rice production, (see the last issue of the Bulletin No. 10), the rice produced will have to be exported and the quality and fineness of the grain will need to be adjusted to meet the demand of the export market. Third with the increasing spread of short duration varieties, the multiple and mixed cropping pattern for each district will have to be further developed—how paddy will rotate with millets, pulses, vegetables and other commercial crops. In this pulses deficit state, the recent release of the 65-150 days maturing greengram, redgram and khesari dhall which can be rotated with paddy under wet, and other crops under dry conditions must be taken advantage of fully.

A further issue in our increased rice production is the second generation problem of improved profitability in drying, threshing, hulling, milling and post harvest operations generally. In this connection, the State, large farmers and the rice mills in the State should study the recommendations of the October FAO-UNIDO Seminar held in Madras on the industrial processing of rice. Like all international seminars, the recommendations are broad based and general and will have to be examined from the point of view of the conditions in the State. There is no doubt that the State is losing in both the processing of rice and the use of its bye-products. The Minister of Planning estimates the former cost at Rs. 100 crores for the country. The most economical type of rice mill for the State must be examined. The seminar's preference for small self-contained half a ton rice mills may not be suited to

the State. Its recommendations for local fabrication of the component parts and the maximisation of the volume and use of the husk should be put into effect speedily.

The State has reimposed the 25 per cent procurement levy in Thanjavur district as of November, reversing the October 5 decision to abolish the levy (see last issue of the Bulletin No. 10). The meeting of Chief Ministers in mid October, agreed with the recommendations of the Agricultural Prices Commission in regard to the procurement target and price for rice. At that meeting, the State expressed its misgiving about the State target. Further the hope of the government that with plentiful production, the price would be maintained at the controlled rate has not been realised. In early November raw rice was selling Rs. 2 per measure and boiled rice at Rs. 1.70 per measure in Thanjavur. The price of Kuruvai paddy in the open market had gone up from the controlled price of Rs. 30 per bag to Rs. 39 per bag of 57 kilos. This price rise continued despite 90 per cent of the Kuruvai crop being harvested. The reimposed levy is applicable to all paddy or rice purchases and stocks moving out of the district. The Food Corporation of India will receive the levy as the State contribution to the central pool.

Agrarian Reform : The increasing rice and food production in the State brings into sharp focus the need for further agrarian reform. The June issue of the Bulletin (No. 5) revised a first report on the Tamil Nadu Agricultural Land Records of Tenancy Act by the Director of Tenancy Records. Now the Intensive Agricultural District Programme has released a pilot study on the tenancy pattern in three areas in Thanjavur district. The study's main conclusions which can help in the next stage of agrarian reform of the State are : (i) Farming efficiency is highest in owner operated farms and lowest in tenant operated absentee land lord farms. In owner operated farms improved techniques of cultivation are constantly applied: (ii) owner-tenant relations are deteriorating leading to loss in operational efficiency, declining propensity to investment and fall in production: (iii) where tenants do not cultivate their lands, there are sub-leases and benami leases to landless cultivators: (iv) while there is scarcity of labour during cultivating season, the surplus labour and heavy underemployment

for the major part of the year can be corrected only by the development of agro-based and cottage industries: (v) temple owned lands operated by tenants are the least efficient cultivators & are heavily in default of the rents due to the temples and matts. Here again tenancy rights and actual cultivating responsibilities do not coincide. These conclusions buttress the findings of the earlier survey and indicate the next stage in the State's agrarian reform calendar which must cover tenancies of all kinds—in relation to owners, temples and all forms of benami tenancy transactions. In developing this legislation, the three year crash programme in Chingleput where pattas are being distributed to 20,000 Harijans, in addition to the 50,000 ownership rights already conferred might be evaluated. Here the study should examine the minimum land area which makes for viable cultivating ownership.

Floor saving and water use : Such reforms have relationship with many problems facing the cultivator and agriculture in the State. They provide an incentive for profitable cultivation of hitherto unused land. The Cement Service Bureau's 100 square feet impervious bed in Alwarpet on which paddy seedlings planted on July 20 were harvested in early October—in less than 3 months —is an important pointer for use of sandy and so called uncultivable areas. The yield in the Alwarpet area was 1300 Kg. of paddy. More generally in this experiment and that of the drip irrigation method which provides a moisture saving floor, a variety of crops can be grown in all sandy and loose soil areas. Another area where there is need for similar inducement is in the economical and efficient use of water by the farmer, whether it be from a major irrigation source like Mettur or from wells and bore-wells as in Chingleput district. Present estimates of water wastage in farming are of the order of 40 per cent. An agricultural water policy for the State must begin with an assessment of water needs for each crop in each soil condition, ensure aligning the transmission and distribution system economically including the lining of canals and provide for education of the cultivator in the use of water. Such a programme is necessary to maximise the returns from the ground-water utilisation schemes which the State has launched with the help of a number of foreign technical agencies and the R.B.I and A R.C. support to the water

conservation schemes. It may also have a spill over effect with regard to the Rs. 45 crores World Bank/Tamil Nadu water supply scheme.

Groundnut and Tapioca: An important break through in groundnut production has been achieved with the successful development of the new strain TMV–10 which can be grown in dry areas. It has a 3 month duration and produces 650 Kgs. per acre. Its net return is Rs. 500 per acre to which should be added a more than 50 percent increase in its oil content compared to that of strain TMV-2 which it now supercedes, So too is the release of the three new tapioca strains in face of the low yielding virus ridden current varieties. (See issue No. 9 of the Bulletin). Tapioca is an important industrial raw material in the State, mainly as a feeder to the Sago industry. The Salem and Chingleput areas where tapioca is grown can now use these three high-yielding, disease resistant, high starch content strains. They will double the farmer's income to around Rs. 7000 net per hectare. Other areas demanding urgent research remedies are the coconut wilt disease now spreading into the State in Shenkottah and Dindigul, from Kerala, and improved cardamom and cashew varieties.

Sugar beet: Another important experiment in the hilly areas of the State is sugar beet growing. In Kodaikanal, Ootacamund, Yercaud and the Annamalais high yielding sugar beet varieties have been planted on small 10 cent plots and harvested in December. The stakes in this experiment are high for the State. It is now clear that the best sugar-cane variety grown in the State while yielding 35 tonnes per acre, will never have a higher recovery than $8\frac{1}{2}$ to $9\frac{1}{2}$ per cent per tonne. Where varieties with a higher recovery percentage are grown the yield per acre for those strains are less. And so the fact that sugar beet grows at 20 tonnes per acre with a recovery of 16 to 18 per cent per tonne is decisive. There are 1 lakh acres available in the hilly region to grow this crop. The problem is on the side of the 19 sugar mills with an annual production of 2.9 lakhs tonnes from cane. There will have to be both a transition to sugar beet processing in some cases and in others, the development of crushing techniques for both

crops. With the decision of the Union Government to maintain the minimum price for cane at the level of the price of the previous season, (see last issue of the Bulletin No 10), it is imperative that the sugar mills in the State turn to the encouraging production of sugar beets and take over their processing.

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Industrial Developments.

Salem Steel : The over all aim of the Union Government is to make the country self-sufficient in steel by 1980 As analysed in the October issue of the Bulletin (No.9), this aim involves producing 14 million tonnes of steel by 1980 on the assumption that the eight steel-plants including Salem will have a 20 million tonnes ingot capacity. This assumption rests on (a) investing a further Rs. 2,600/- crores in steel upto 1980, (b) maintaining a strict time schedule for construction or expansion of the plants, (c) working the plants at about double their present rate, that is, upto 90 per cent of capacity. The most serious question in this three fold assumption is the second one -- the tight time schedule. Already steel prices are soaring ; iron rods are selling at Rs. 2000 per tonne and plates at Rs. 3000 per tonne. Even at these prices, steel is in short supply and many small and medium industries are closing down because of lack of steel. Every year of delay in the time schedule will mean an import bill of Rs. 200 crores. What throws the time schedule out is the decision to base the construction programme, including the Salem Steel Plant, entirely on local production of machinery and on indigenous know-how. This import substitution assumption can be put into practice as displayed by H E C which fabricated the Bhokara and Bhilai sophisticated machines. But then the time needed will be much longer than the one now programmed. This is a matter of comparative costs-benefits computation. It ought to be easy to determine whether a more gradual import substitution programme, together with some import of essential machinery will not be less costly for the country and the economy—in meeting more rapidly the demand of ancillaries, in avoiding close down of plants and rising unemployment and in reducing the drain on the limited pool of foreign exchange. Prima facie there is a strong case for import of some equipment

for Salem, Hospet and Visakapatnam because of the over riding need to keep to their time construction schedule. In the case of Salem, the reaffirmed decision to use Kanjamalai ore and the possibility of using coke imported from the north, if the final tests of lignite indicate their unsuitability, is welome. Now what is needed is for the consulting engineers to decide on the product mix and the land acquisition programme to be pursued with no let up.

Railways : Among the victims of the mid term Plan appraisal are the Madras - Arkonam and Madras - Vijayawada electrification projects and the construction of the broad gauge line from Karur to Madurai and the conversion to broad gauge of the Madurai—Tuticorin and Maniyachi—Tirunelveli sections. The railway Fourth Plan investment budget has been cut by Rs 250 crores and the vague hope that these reductions can be restored through internal earnings of the railways is not likely to materialise. Instead of contributing Rs. 415 crores during the Fourth Plan, the reduced contribution target of Rs. 165 crores is not likely to be attained as the contribution of the first three years stands at only Rs. 66 crores. The main reason for postponing schemes to the Fifth Plan is stated to be the lack of economic justifications. In the case of Tamil Nadu however, the engineering, market and traffic surveys have been completed and the economic growth of the State demand these investments. In the last issue of the Bulletin (No. 10), the rail transport bottleneck has been highlighted in relation to the sugar, cement and textile industries in the State. Tuticorin and Madras ports are expanding export points. In November the Madras harbour registered a world record in the manual loading of iron ore. As against a normal 8000 tonnes per day, on a single day working in three shifts, 17,099 tonnes were loaded on the Rumanian ship 'Lupeni'. In 1970—71 iron ore exports from Madras totalled 2.16 million tonnes as against 2.1 million tonnes in the previous year.

Tuticorin which now handles one million tonnes of cargo will, on completion of the four berths, handle a traffic of 2.5 million tonnes rising by the end of the decade to 5.28 million tonnes. It is the only centre in the State exporting palmyrah fibre. In the last three years, these exports have been expanded by one hundred per cent and the demand for it is continually increasing. Its

processing and quick transport enable it to sell at a higher price in the foreign market than other Indian fibres. Both Madras and Tuticorin are also transport outlets for the booming engineering exports trade. In the first half of this year exports to the value of Rs. 64 crores have been shipped, compared to the Rs. 50 crores in the same period last year. In fact the engineering exports are likely to reach a figure of Rs. 110-120 crores for this year.

These and other indicators should be examined before the growth retarding decisions about postponing planned railway investments in the State are finalised. As far as passenger services are concerned, the State Transport department should tailor its long distance express services in light of whatever decisions are made in the railway area. The scheme to rationalise its express services through quick connections between important traffic centres, revision of timings etc., might act as a fillip to the competing or non-existing railway services.

Fertilizers, crude and Industrial alcohol : As indicated in the last issue of the Bulletin (No. 10) the State shares in the generally satisfactory position of the country in fertiliser production. For the country as a whole, self-sufficiency in fertilisers will be attained by 1976 with an installed capacity of 3893 million tonnes of nitrogen and 1437 tonnes of phosphatic nutrients. In the State a large surplus will be developing with the Madras and the Tuticorin plants in full operation. There is now need for action on three lines. First by the end of this year all imports of fertilisers should be discontinued in order to ensure a smoothly functioning market. Second the public sector fertiliser units management and functioning in the country should be rationalised to increase their production from the present 55-60 per cent to 90 per cent. Third there is need to tailor the production pattern to the changing demand which various high yielding varieties and soil conditions call for. There is now time to make this fast growing industry more closely demand based.

On the other hand the prospects with regard to crude and industrial alcohol in the State and the country are disquieting. Imports of crude are taking place at higher prices primarily because of the fall in the value of the dollar and the desire of the

producing countries to secure their export returns not in dollars as in the past, but in German marks, Swiss francs, and other strong currencies. And so the government decision on prices for imported crude and related petroleum products are awaited with eagerness both by the industry and consumers. Some cost escalation on account of crude and petroleum products for most industries seems inevitable.

The suspension of prohibition in the State has had unexpected industrial effects in the acute shortage of industrial alcohol. Chemicals and Plastics (chemplast) which produces polyvinyl chloride is in difficulty. For its existing capacity of 8,400 tonnes, it has the requisite polyvinyl, but needs an assured supply of 2½ million gallons of alcohol. For its expanded capacity of 20,000 tonnes by next year, it will need double that amount of alcohol. On the supply side responding to the price structure and the profit margin, the two distillaries in the State have diverted their production to potable spirits, thus sharply reducing industrial alcohol supply. There is need for the government and the industry, such as E. I. D-Parry, Trichy distillaries, Aruna sugars and all distillaries in the State to expand their production to meet the increased demand both for spirits and industrial alcohol.

Other trends: Four new industrial activities have been cleared for the State. They are units for the production of calcium carbide, borax, sponge iron and nylon. These will be meeting in part the industrial gaps to which reference was made in the last issue (No. 10). Further U. M. S. Radio Factory in Coimbatore has produced a mini-electronic calculator–the smallest and cheapest one in the world. It is produced with 90 per cent indigenous components, fits into one's vest pocket and provides all arithmetic operations for eight digits. This product of the State's small industry now has a large and expanding export market awaiting it. A final comment. Cooptex, the Tamil Nadu Handloom weavers cooperative society increased its deepavali sales of silk saris five times (Rs. 25 lakhs) compared to last year's sales (Rs. 5 lakhs). Working on a no-profit no-loss basis, it has been of benefit to the primary societies and producers. At a time of price inflation and the general call to reduce consumption, this consumption expansion, however, raises questions.

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Education and Science :

Unesco's Silver Jubilee : On November 4, Unesco was twenty five years old. The whole State and country celebrated that day in meetings, conferences, radio talks and discussions, school and college gatherings. The major event was the celebration organised by the Indian National Commission for Cooperation with Unesco and the National Council for Educational Training and Research in Delhi. On the eve of the day, there was a 30 minute symposium on Unesco, broadcast throughout the country by the A. I. R. On the Fourth, there was an exhibition of school science opened at the campus of the National Council and a public meeting at the Mavlankar auditorium at which the Minister of Education and the Director of the Madras Institute of Development Studies spoke about Unesco. They were followed by a cultural performance by the Delhi schools children and films on Unesco's activities in India. In the State many schools and colleges celebrated the day including the National Council of Women, the C L R I and the University colleges.

Educational Reform Proposals: The Science exhibition organised by the National Council of Educational Research and Training displayed a completely revised primary, middle and higher secondary science syllabus, text-books, teaching aids and science kits for primary schools and simple laboratories for secondary schools. The Council is also running a teacher educators' training programme to train teacher educators in the new science curriculum. A similar reform programme is under way for social studies, history, geography and economics. The National Council, under its dynamic director Prof. Aiya and an able group of educational and science researchers, represents a centre of educational and pedagogic excellence, so essential for the vast educational investment in the country. In the State, it is the Institute of Education which has the responsibility to diffuse the result of this reform movement based on high levels of research which are maintained by the Council. Unesco and Unicef are associated with the Council in this programme.

Another area of education being pioneered by the National Council is population education and educational technology. In

population education, at the early school stages it is man, the environment and attitudes on which attention is being concentrated, moving on to population, growth problems etc., at the later education stage. This is an experimental programme on which a great deal of further research needs to be undertaken both at the level of the National Council and in the State Institute. The National Council has also developed a good programme of teaching films, filmstrips and visual aids. Its educational film library is the largest in the country and should be used more extensively by the State. With the development of Television in the State, for which the 5 acre ground has been cleared in the Government Estate, this new facility will become available by 1974. It is important that work should now begin in the State for developing educational television curricula in science and technical subjects and in the training of teachers for using this important medium. Unlike the radio field, educators should be fully involved in the use of Television in the school and out of school programmes. The National Council is pioneering this area with an educational T.V. cell that is being developed with the help of Unesco. As language will be dominant in this medium, the State must lose no time in training its teachers and adapting in Tamil the curricular material and courses being developed by the National Council.

A challenging educational programme is proposed by the S I T U Council of Education based on two years of research and case studies. Its main finding is that children may be taught to read between the ages of three and five. A child's readiness to read is indicated when he or she asks that the caption of a picture be read and explained. This reading readiness which begins at age 3 leads to the proposal to merge pre-primary with primary schooling, and start Class I at age 3, Class II at age 4, Class III at age 5, so that present standard I will become class IV. This reform has its own problems but it will get rid of the present class bias in pre-primary education, solve the problem of drop outs, as a child does not become an economic agent until he or she is 7 years old, involve parents very closely with the educational system and allow a flexible pupil centred curriculum and learning.

The Madras University has introduced three new courses in M.Sc., in design and production of thermal power, aeronautical

and power engineering and harbour and coastal engineering in order to meet the new industrial and development demands in the State. Simultaneously discussion between government representatives and principals of engineering colleges have been initiated for establishing a technical university in the State. The many inter related problems raised by this project have been referred to in the last issue of the Bulletin (No. 10). In the technician field, K. P. Joseph, a machinist of Ashok Leyland won the President's gold medal in the all India skill competition, bringing to 20 the number of medals won by Ashok Leyland technicians since 1968.

Science Research: A further step in the implementation of the Sarkar Committee recommendations concerning the C S I R was taken at the October meeting of the Directors of the National Laboratories, the Director General and the Minister of Science and Technology. By the end of the year, the C S I R will be reorganised along lines of the recommendations of the committee—see October issue of the Bulletin No. 9. The consensus at the meeting was that "the C S I R should develop an Institutional culture" the scientific culture of the country would now become institutionalised and expressed in democratic decentralisation.

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Western Regional Population Conference:

The Conference organised by the Population Council of India and the Council for Social Development met in October in Ahmedabad and was attended by population specialists, family planning, health and medical practitioners from Bombay, Goa, Gujarat and Madhya Pradesh. To date, from the First Plan, India has invested around Rs. 200 crores in population control and family planning. The Fourth Plan provision is Rs. 400 crores. The question posed to the conference by the Minister of Planning was the benefits that had accrued to the country from this investment. It was decided to undertake a cost-effectiveness study of this investment. Apart from other decisions as to the use of termination facilities for pregnancies, mobilising the resources of voluntary agencies, and some very pointed recommendations on motivations and mass

media use in family planning programmes, the originality of this conference was its administrative and management recommendation that there should be a single integrated service covering public health, nutrition of the pre-school child and lactating mother and family planning at the State, district and panchayat level. This management system should be carefully examined and adapted to conditions in this State by the task force on health and nutrition of the State Planning Commission.

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Seminar on Objectives of Bank Nationalisation :

The Seminar to appraise the two years of the Nationalised Banking system organised at Coimbatore in November by the Union Planning Commission and the Sri Ramakrishna Mission Vidyalaya brought together 150 bankers, economists and government finance officers. Two years could only indicate a start, not even a trend. There were sharp divergences between bankers and economists on the two year record in terms of the objective of social justice—the terms, procedures and volume of credit to the neglected and priority sectors. There was agreement that a good start had been made in providing banking facilities to the non-banked rural areas, and in entering the new field of agricultural and small industry finance. The recommendations were aimed at strengthening the mobilisation of deposits as a means of increasing the savings/income ratio, increasing the financing of agriculture and small industry and simplifying procedures, rationalising management and ensuring coordination of the many sources of credit at the district and panchayat levels. The Seminar could be an important event in the developing capital and credit structure of the country. The paper submitted to this seminar by the Director, Madras Institute of Development Studies appeared as the Second Article in the November issue of the Bulletin (No. 10).

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November Madras Development Seminar :

The November Seminar paper, A Science Policy for Tamil Nadu, by Dr. A. Ramakrishnan, Director, Institute of Mathe-

matical Sciences, Madras, together with a summary of the discussion of the paper at the seminar appears as the first article in this issue,

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Second article :

The Role of Youth in the Second Development Decade, appears as the second article in this issue.

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Correspondence :

A further report by the Osmania group on the follow-up of the Economics Research Methodology workshop, A reply by Dr. C. T. Kurien and a Communication on Science and Technology by Mr. Ward Morehouse, appear in the correspondence section.

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Special Section.

This Special issue, as stated in the July Volume (Vol. I No. 6), contains a special section in which the 22 papers used by the seminar on consumer/user oriented research (September 17 to 19) appear. The Final Decision of the Seminar appeared in the October issue of the Bulletin (No. 9) and a summary report on the seminar's work and discussions appeared in the November issue (No. 10).

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"A SCIENCE POLICY FOR TAMIL NADU"

By

DR. ALLADI RAMAKRISHNAN

Director, MATSCIENCE, Madras-20

Scientific administration in India is conducted today mainly through three channels :

1. The department of Atomic Energy, Government of India
2. The University Grants Commission, and
3. The Council of Scientific and Industrial Research

I had the privilege of being closely associated with my teacher Professor Bhabha who was responsible for the creation of the Department of Atomic Energy and was the first chairman of the Indian Atomic Energy Commission. I am well aware of the circumstances under which Sri S. S. Bhatnagar created the chain of national laboratories immediately after our country gained independence. I also closely followed the creation of the University Grants Commission and watched its role during my tenure as Professor at the Madras University and as a member of the U. G. C. expert committee on mathematical education.

While India has made good progress in the scientific field, we have to concede that *our contribution in relation to international science has not been commensurate with the large amounts of money that have been expended during the past three decades*. During this period I have visited over a hundred institutions in the world where I had opportunities to lecture on my research work and met over five hundred scientists of established reputation in the domain of mathematical sciences. Therefore, instead of making a critical appraisal of the present situation in Indian science I would like to place my suggestions in a forthright manner regarding the tasks to be undertaken particularly in Tamil Nadu during the next ten years.

I am encouraged to assert, with the pardonable pride of a citizen of Madras, *that Tamil Nadu has the finest chance of contri-*

butting effectively to the scientific, technological and educational development of our country. Everything is in favour of its playing a pre-eminent role—a long and continuous tradition of learning and scholarship, the estimable contributions of its scientists, the significant achievements of its engineers and the high standards maintained by its schools, colleges and research institutions. What is needed is just *a co-ordination of effort, a sense of national pride and a new stimulus for creative science.* This has to be done at all levels—school, college, post-graduate and post-doctoral.

OUR SCHOOL EDUCATION

It is a curious fact that high school education in Tamil Nadu not only compares favourably with that of highly developed countries but is in some respects ahead of international standards. This is because of the age-old Indian tradition of parents taking an active interest in the education of their children and the commendable devotion of teachers to their tasks. Our school teachers are doing splendid work though they are contending against very difficult conditions. The administration of any high school is under a "secretary" or a "correspondent" who may not have the requisite qualifications for being the trustee for the education of a rising generation of citizens. In many cases he is just tied by 'blood and favour' to the financial supporters of the Institute. It is desirable that the Government prescribes rules and procedures for the appointment of such "secretaries". The Government should also insist on the appointment of an advisory body for each high school consisting of scientists and educationists who may meet once a year, examine the progress of the school and offer suggestions for improvement. The very existence of such an advisory body would ensure that many malpractices regarding the admission of students and recruitment of staff are avoided.

On the whole I am of opinion that the education in our schools is in a satisfactory state except for some curable ills.

OUR COLLEGE EDUCATION

On the contrary our college education requires a total re-examination and needs almost revolutionary changes.

1. There should be an almost inflexible rule that any University class must be taught by teachers with adequate qualifications, i.e. the pre-university and B.Sc. by those with M.Sc. degrees, and the M.Sc. classes by those with at least Ph.D. degrees.

2. The most regretable feature of the present graduate education is *the woeful lack of exposure to modern scientific thought* through lectures of visiting professors and scientists. There seems to be an appalling apathy and unjustifiable reluctance to invite visiting professors though the financial commitments would be very small indeed. The real reason seems to be that the authorities are *unduly apprehensive of competition.* A good visiting scientists programme will provide the stimulus of competition which is the breath of scientific life. *A provision for twenty five lectures per year from outside scientists should be made in each department.* This would imply approximately only five thousand rupees per year per department for providing a modest honorarium and travel expenses for each invited speaker.

3. There should be an Academic Council for each college which should consist of senior representations of the Academic staff and some scientists and scholars from outside the organisation.

POST-GRADUATE RESEARCH

There should not be the slightest compromise in the standards to be aimed at and maintained in scientific research. There can be no substitute for excellence. Inadequacy of facilities or shortcomings in administration cannot provide an excuse for the dull, weary, stale and unprofitable use of our valuable resources of manpower and intellectual potential. The blame essentially lies on the scientist who slides into complacent mediocrity; conveniently blaming external conditions for his inadequacies.

What is needed today is a suitable forum for expressing and assessing scientific ideas and this can be provided through conferences, seminars and symposia. The aim of every working scientist should be to get his work evaluated by experts in the field; their critical estimate should determine his status and his role in society.

One of the serious drawbacks in our scientific endeavour is the total lack of contact between industry and technology on the one hand and pure fundamental science on the other. In the United States the mathematician, engineer, chemist, metallurgist, economist and administrator, have competed and collaborated to achieve the 'mission impossible'—man's journey to the moon. How is it that inspite of three decades of scientific effort, industrial development and frequent travel to foreign countries, our scientists still stand isolated from problems of real life and national needs.

They avoid such a confrontation since we expect miracles from them and become disappointed if they do not fulfil our expectations. Science is a systematic application of the method of trial and error, of adjustments and revisions, of innovations and rejections, under pressure of logic and necessity. Only such a realistic approach can lead to fruitful co-operation between science and industry-

Systematic and scientific investigations should be undertaken for *the conservation and proper utilisation of our national resources.*

It is a sad and melancholy fact of our academic life that our distinguished academicians are condemned to premature retirement. In a fitful fever for encouraging youth and talent we are cultivating an impious disregard for loyal service and long experience. Unlike a civil and administrative official, an academician acquires a permanent position only in his middle thirties and therefore it is appropriate that the age of retirement should be raised to *sixty-five.* The professorships at Oxford are tenable till sixty-seven while in the United States the generally accepted age of retirement is sixty-five. Moreover emeritus professorships are awarded as recognition of loyal and meritorious service.

It is said that the test of a civilised society is the manner in which it honours its dead. We should at least honour the living who have served us so well in the cause of education through long years of dedicated service. Is it not a great stimulus to youth if it can look forward to enlightened recognition of distinguished service and outstanding achievement ?

A SCIENCE FOUNDATION

In pursuance of these objectives, I place the following suggestions for the consideration of the Government of Tamil Nadu.

1. The immediate creation of a *Tamil Nadu Science foundation* the primary function of which is the allocation of funds for the advancement of science and technology. The foundation may be composed of senior representatives of Government, of educational Institutions and scientists of established reputation:

2. The formation of a *Tamil Nadu Science Academy* whose duty is to advise the Foundation in regard to the allocation of funds, to estimate scientific work and award prizes and honours for significant achievement.

3. Establishment of media for publication of scientific research and the dissemination of scientific knowledge to the citizen. This can be done through three classes of journals under the auspices of the science academy :

(1) Advanced journals containing original contributions in research,

(2) Journals propagating science to the citizen,

(3) Journal for short communication for the rapid announcement and dissemination of results of research.

A SPLENDID CHANCE

Looking at the Indian scene there seems to be no prospect of such a leadership from the existing sponsors of scientific research. Ten years ago Tamil Nadu took the bold and imaginative step of creating an Institute of advanced learning like MATSCIENCE instead of yielding to doubt and hesitation or waiting for the tardy and reluctant support from external sources. Will Tamil Nadu seize time by the forelock and take a leap into the future in this atomic age when interplanetary travel is becoming a part of our way of life?

A splendid chance awaits our happy State. We have good reasons to believe it will take it.

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In the discussion of the paper at the **Seminar chaired by** Professor S. Sampath, Deputy Director of the Indian Institute of Technology, Guindy, Madras, the author stated that the paper arises from his own work which has resulted in the publication of over 500 papers and several books alongside of personal contact with hundreds of scientists in the State and all over the world. His main contention is that the contribution of scientific research in India is not commensurate with the expenditures which have been and are being incurred. His analysis rests on the proposition that we are spending more on science than we need, so that the science policy for Tamil Nadu is not a plea for more funds for science. The problem is institutional and administrative at the graduate, post-graduate and research levels. College science is not taught by adequately qualified scientists, colleges and universities are closed institutions without windows opened to the world of science, the age of retirement of distinguished scientists, adding to this unsatisfactory science situation. The author expressed general satisfaction with school education and school science in Tamil Nadu. His major recommendation for the starting of a Science Foundation and Academy in Tamil Nadu is related to the unsatisfactory status of science at the higher levels both in the country and the State. There was today an opportunity for Tamil Nadu giving a lead to science in the country.

One of the basic assertions of the paper, namely that school education and school science in the State are satisfactory, was sharply contested. In defence of the view it was explained that the 12 to 14 year old school boy or girl was as well developed and as intelligent as his/her counterpart in the West. Against this, the majority view was that school education and school science were as badly in need of reform as education and science at the higher stages. The 12 to 14 year old school pupils referred to with satisfaction are those studying in a small minority of good schools run as Central schools, by Convents and a few high level private agencies. As evidence of this, there was reference to the NCERT Science Talents Scheme where those identified are from these few high cost and high class institutions. A further criticism of school education and science in the State was that even these few high qualified schools were good at preparing

their students for the next school year but not for employment opportunities or work in the labour market. This was the general situation of the school system as a whole. It did not fit its drop outs or its levers for gainful employment. What is needed is a system of science instruction and education which will respond to the skill demands of various levels in employment.

The establishment of the Regional computer facility with the installation of the latest model IDM 370—155 at the Indian Institute of Technology, Guindy would represent an important stage in the science development of the State. Tamil Nadu lags far behind Punjab, West Bengal and Maharashtra in its computor programming services and this lack would now be corrected. Another area where the State is lagging but has all the facilities in know-how and equipment is electronics. While Delhi has over one thousand electronic units in the whole of Tamil Nadu, there are not even 20 in the State. The Institutions proposed by the author could be instrumental in spreading rapidly units engaged in micro minaturisation and integrated electronics generally.

One of the serious problems that science research in the State faces is lack of organisation, lack of recognition, and lack of a forum for mobilising and utilising the high level talent and know-how in the State. In this connection the non utilisation of the mathematical scientific and engineering resources of the State represented by institutions like the Institute of Mathematical Sciences, the Engineering Colleges at Guindy and Coimbatore and even the centrally sponsored Indian Institute of Technology in the two important central scientific projects, the Nuclear Energy Station at Kalpakkam and the new Rocket Station being built at Srikauta, both of which are within commuting distance of the city, was noted with regret. Whether this exclusion of high level researches from the State in these projects was accidental due to a lack of proper planning and communication or note, the major recommendation made in the seminar paper for institutionalising scientific research and know-how in the State is both timely and practical to avoid wastage of this order.

Another gap which the institutional frame proposed could fill in is to link the State's science and technology with the State industry. The past and present lack of relations between the two have been widely and repeatedly recognised. The science foundation could arrange programmes for scientists to serve in industry and industrialists to serve in scientific institutions. A start could be made in establishing such relations between the Indian Institute of Technology and the Engineering Colleges on the one hand and the industries in the private and public sector on the other. A crash programme could be launched under which 10 percent of the staff of these instituions could be seconded to these industries for the periods of 6 to 12 months and industrial engineers and managers replace them in the Indian Institute of Technology and the Engineering colleges during that period. In this way the normal rule that no professor of an engineering or technological Institution should hold a chair unless he has served in industry would be implemented.

An important recommendation in the paper concerns the launching of three classes of scientific journals. The current science journals in the State are too small, too insignificant and not of the normal scientific standard. A Tamil scientist who desires international recognition has today to write in a foreign journal. The Foundation proposed could launch a substantial and high level programme of journals and publications to close this gap.

The seminar unanimously endorsed the proposals for the Tamil Nadu Science Foundation and commended it to the attention of the State Planning Commission, its task force on Education, Science and Technology and its working group on science and technology which is led by Dr. A. Ramakrishnan. It requested the author to work out the financial implications of the Foundation—capital and recurring—which will have to be met by the State Government and the National Council of Science and Technology and forward his conclusions to the State Planning Commission.

The seminar also endorsed the proposal for a Tamil Nadu Science Academy and suggested that the State Planning Commission through its working group on science and technology should draft an Act which the Tamil Nadu legislature can pass. On the basis of this statute, the scientists could then elect the membership of the Academy.

There was general agreement that the way forward for an effective and viable science policy for Tamil Nadu has been clarified in the paper and the discussion.

YOUTH AND THE SECOND DEVELOPMENT DECADE OF UNITED NATIONS.

The United Nations.

The role of Youth for Development and in relation to the launching of the Second Development Decade of the United Nations is the subject.

In 1945, fifty-one countries met in San Francisco in the United States and declared: "We the people of the United Nations, determined to save succeeding generations from the scourge of war and to promote social progress and better standards of life in larger freedom, will employ international machinery for the promotion of the economic and social advancement of all peoples.." Today, all countries, and there are one hundred and thirty-one of them, are members of the United Nations. The United Nations spends about $ 700 million a year to maintain peace in our world, promote friendship and co-operation among peoples and nations and engage in a gigantic programme of development.

Development.

Poverty: Development is a programme to fight against poverty. Poverty we have always had. The poor are always with us. What development attacks and wants removed is the scandal of the rich getting richer and the poor getting poorer every day. The gap between the rich and the poor is steadily widening both between countries and within each country. The rich countries, which comprise Europe, North America, Australia, New Zealand and Japan have increased each of their person's annual income during the last ten years by $ 300, while a person in Asia, Africa and Latin America, which comprise the poor countries, has been able to increase his annual income by only $ 12, in that period. The rich countries/poor countries gap widens with the years. If nothing else is done, at the end of this century, which is only

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* Extracts from an address by Dr. Malcolm S. Adiseshiah to the XXIII World Scout Conference, Tokyo, Japan, in August 1971.

twenty-eight years away, an American will be earning $ 10,000, instead of his present $ 5,000, an Asian and African will earn $ 200, instead of his present $ 100, and a Latin American will double his earnings from his present $ 500, to $ 1,000. So our world divides itself into a rich north, in which one-third of our people live, and the poor south in which the remaining two-thirds live. A similar widening gap between the rich and the poor exists within each poor country. Taking India as an example, in 1960, sixty per cent of the people were living at the poverty line, earning less than $ 30, a year, while the remaining forty per cent had an annual income of $ 120. During the ten years period ending last year, 1970, the poor people increased their income by two per cent, while the rich increased theirs by four per cent. During these ten years the consumption of the poorest five per cent decreased by one per cent the poorest twenty per cent increased theirs by less than two per cent, while the forty per cent well-to-do increased theirs by five per cent.

I have described this kind of growing inequality in the well-being of people, whether looked at as countries or as peoples, as a scandal. It is a scandal from the economic point of view. We know that neither a country nor the world can be half-slave and half free. We know that poverty anywhere is a threat to prosperity everywhere. We know that money invested in lifting people and countries out of poverty is good business. It pays off in new markets and high demand pressures which can only be met by the rich countries' production. The inequality is also a moral scandal. His Holiness, Pope Paul VI, in his encyclical Popularum Progressio reminds us that the rich have an obligation to share their wealth with the poor.

We have begun to do this nationally within the rich countries through our social security schemes, old age, unemployment, widow and disability pensions and minimum wage laws. We need to extend this sound moral principle so that we have a kind of World Social Security Scheme, regulating the relations between rich and poor nations. Inequality is a scandal from the political point of view, because as we let the gap between the rich and the poor grow, we are endangering the peace of the world. We are like a person sitting complacently on a keg of gun power with a

lighted cigarette. In the sixties we saw that only one country whose people were earning $ 750, and above, underwent a major internal upheaval, whereas eighty-seven per cent of the countries whose people were earning less than $ 100, averaged two political and violent revolutions. The way to peace and security is through fighting poverty and arresting the widening rich-poor gap, not spending as we did last year $ 212 billion on arms, bombs and missiles in the name of peace. This incredible armament expenditure shows that we have the resources to fight poverty. What we do not have is the right priorities. Development facing poverty demands that we get our priorities right.

Hunger: Development is a programme to combat hunger. Of the two billion people living in the poor countries in Asia, Africa and Latin America, one quarter, that is five hundred million men, women and babies, go to bed every night hungry. And if this situation is not corrected by the end of the seventies, there will be 1.2 billion hungry people. Hunger results from insufficient food which in turn is due to neglect of our agriculture and the inequitable distribution of its product. During the greater part of the sixties, the poor countries did not produce enough to feed their people and had to import eleven million tons of wheat, rice and other cereals mainly from the United States, Canada and Australia. Alongside of this limited food production, their distribution and diet habits have resulted in the majority of their people suffering from malnutrition. In addition to the five hundred million hungry people, we have nearly one billion people in Asia, Africa and Latin America, who are eating the wrong kind of food and so suffer from malnutrition. The most serious form of malnutrition to life is deficiency in proteins. Protein deficiency between the ages of one to five in a child is irremediable. That is the time when its brain is formed and protein deficiency during that period irrepairably damages its brain and no amount of good schooling or good food later can repair the damage. The United Nations Protein Advisory Group tells us that twenty per cent of all children under five in Asia, Africa and Latin America, suffer from protein malnutrition and twelve million of them die annually. The damage, however, is more extensive because of the protein deficiency of pregnant mothers, something

like seventy per cent of those living in rural areas, who must be added to this tragic tale. In a recent survey conducted in India, it was found that 326 million out of 540 million people are subject to malnutrition, 50 million die of it and 82 million children suffer from protein deficiency, with resulting mental retardation. Development demands increased food production, its fair and effective distribution and a balanced nutritional diet.

Unemployment: Development is a programme that must combat massive unemployment and under-employment in the poor countries. To-day there are seventy-six million workers in Asia, Africa and Latin America who are unemployed and in the seventies there will be 226 million new workers looking for employment. This total of 300 million people who are and will be looking for jobs are already born and growing up for the labour market. No amount of population control and family planning can change this massive demand for jobs. This situation is caused by two factors operating in the poor countries. First is the very rapid increase in their population which increases the number of people seeking work. Taking India again, there are today 100,000, young workers entering its labour market every week and in two years there will be 120,000 young people seeking work every week. Second is the economic policy followed by the poor countries which has not increased employment as fast as the growth in their production or labour force. The countries have kept their eye on attaining a high rate of growth (G), which is all right if its capital output ratio C/O) is kept low while the rate of investment (R) is increasing. Increases in R have, however, led to increases in C/O, which means that the poor countries have expanded their capital intensive industries and so labour demand has not risen fast. Even agriculture which is generally held to be twice as labour intensive as manufacturing is really not so, as there is a great deal of under employment in the rural labour force. In a factory you are either employed or unemployed from 9 a.m. to 5 p.m, every day for 365 days, barring holidays. On a farm you may be employed for half a day weeding or harvesting and you normally work for two hundred days in a year. If agriculture and industry contribute 60 : 40 to a country's total production, if industry increases at 15 per cent and agri-

culture at 5 per cent, G, the growth rate will be 9 per cent, but the increase in labour demand will only be 6½ per cent. This is typical of what is happening in the poor countries, employment is increasing 1/3 less than the economy. In Latin America during the Sixties, economic growth was 4.8 per cent and employment growth only 2 per cent. In the Republic of China, the capital-worker ratio in textiles is 48,000 Chinese dollars compared to 2,600 in its retail trade. And so with high labour force expansion and (G) growth oriented development plans, unemployment and under-employment begin increasing. Except for the joint family or the tribal system, the worker has no individual or group insurance to fall back upon and additions to the labour force increase unemployment, but even more depress wages. Development confronts the simultaneous constraints of unemployment and under-employment in the poor countries.

Over-population: Development faces the problem of run away population increase. As a result of modern medical technology, communicable diseases have been eradicated or controlled and so our death rates have diminished. When I was a boy, expectation of life in India was 12 years. Today it is 52 years. On the other hand our birth rates have not diminished and so that rate of population growth has been an unexpectedly rapid one. It has been unexpected because when we started the development programmes and plans in the United Nations in the early fifties, we assumed that the population of poor countries will increase at the old rate of 0.7 per cent till the end of the century. Actually in the last ten years the increase has been by 2.5 to 3 per cent. The annual increase in the poor countries which was then 15 million has now jumped to over 40 millions. And so from today's 3½ billion people, we will be 4½ billion in 1980 and around 7 billions in 2000. Well, what is wrong with so many more people? The more the merrier? Does not every child born into the world bring with it a pair of hands with which it can work and a head with which it can think? And what about all that unoccupied land in Africa and Latin America? All this is true, but large numbers create serious economic, social and moral pressures. It is one of the two causes for mass unemployment and under-employment. All the vacant lands in the world can

only help if every baby could be born not only with a pair of hands, but also clutching a tractor or a computor. More people in poor countries mean that their increased production resulting from their hard work is not being used to raise their levels of living but to build more houses, more hospitals more schools, food and clothing which are shared among the larger numbers at the same low level for each. But the population problem is more than the economic and social pressure of low nutrition, urban sprawling and rural impoverishment. Economic growth, science and technology can and will in time meet and overcome these pressures. What is serious is the moral problem of such large numbers living together in harmony and friendship, practising democracy and community living, and promoting the peaceful arts. When I was born we were 300 million in the Indian sub continent. Today are 700 million in that part of the world and you see what is happening to us. There is for me, twice the opportunity to cheat, to lie, to exploit others and to resort to violence. The dimensions of the demands to serve, to be tolerant and to love have been doubled for all of us. Development must respond to this demographic demand.

Illiteracy: Development faces a world of growing illiteracy and ignorance. Our world is more illiterate in 1970 than in 1960. In 1960 we were 740 million illiterates. Today our illiterates number 800 million. There are some disturbing features of this anti-development force. First this illiteracy mass is concentrated in the countries of Asia, Africa and Latin America. For Europe, North America, Australia, New Zealand and Japan, the problem is one of further and continuing education of their literate people, all of whom have had at least seven years of primary education. Second, while the number of illiterate men, women and children is increasing in the poor countries, their percentage of illiteracy is decreasing. World illiteracy had decreased from 39.3 per cent in 1960, to 34.8 per cent in 1970. The two reasons which explain this seeming contrapiction are the rapid growth of population and the efficacity of the School System. The population of the poor countries has been increasing as we have seen at the rate of 2.5 per cent per annum, during the Sixties. The rate of literacy has been increasing, however, at only 0.5 per cent per annum, The gap be-

tween the two rates explains in part the decrease in the percentage of illiterates and the increase in their absolute numbers. The other reason is related to the functioning of the school system in poor countries. If literacy is equivalent to the education received in the first four classes of primary schooling, the dropping out of 55 to 65 per cent of pupils from the first four years of such schooling, swells the illiteracy stream. It means that though the countries are expanding primary education, for every one person made literate through such education, 1.5 and 1.6 persons are made illiterate. More generally, the education system of the poor countries is a pale, ineffective and unadapted replica of the system in vogue in the rich countries, responding neither to their human, social and cultural demands, nor to their employment profile.

This mass illiteracy and ineffective education system is a serious hindrance to development. Development depends on physical and natural resources and on trained and skilled human resources in about equal parts of 50 : 50. The poor countries, with the exception of a few oil rich Middle East countries and Venezuela, have very limited physical and capital resources. Their abundant human resources which could make up to some extent this physical lock is wasted and blunted through illiteracy, miseducation and lack of training. It is like the non-functioning of the thews and sinews of a live organ. Development demands a massive programme of education and training.

The First Development Decade.

It was against a background even more sombre in terms of poverty, hunger and ignorance, that the United Nations decided in 1961 to launch the First Development Decade in order to trigger the development of the poor 2/3 of our world. It set as targets for the ten year period, the following four major decisions : (a) the poor countries would increase their total production by an annual average of 5%; (b) the rich countries will give the poor countries one per cent of their national income as financial and technical assistance to speed development ; (c) all countries which were colonies and dependencies would be granted independence so that they could undertake their development ; (d) there would

be general and complete disarmament under agreed international supervision, which release new resources for development.

What has happened to these decisions ? The first fact that the First Development Decade recorded is that by 1970 the poor countries did hit the 5% growth goal. In fact, twenty-eight out of the seventy countries which make up the poor world and which include countries in every continent, every religion, every culture and every climate exceeded the 5% goal. At this rate, by the middle of the next century these countries will be in the same position as that of Britain and France today. The First Decade demonstrated unmistakably that the poor countries are not destined to be poor because their climate is hot, or their skin not white, or their religion not Christian but Hindu, Buddhist or ·Muslim, their culture not western but oriental or African. The growth of the poor countries during the Sixties which was due to their own efforts and to the buoyancy of world trade, was as rapid as the growth rate of the richest country in the world—the United States, and as much a miracle as the miraculous growth of that remarkable Asian country, Japan. This growth was caused by all round development in each country through increased savings, major transformation in agriculture, improved roads and communications, a widespread health programme and a big push in education and industry. During this period, over fifty colonial countries became independent and strengthened this world crusade for all round rapid development.

But the Sixties also showed the lacks and defects in this First Development Decade. I have highlighted the massive problems of poverty, hunger, unemployment and mis-education that we confront today at the end of the decade. Gigantic resources are still being devoted to arms and armaments which is an anti-development force. We started the Sixties spending $ 100 billion on arms and ended it wasting over double that amount. International aid and trade to help the developing countries have become stagnant and a threat to development. Between 1955 and 1961 international financial assistance to poor countries steadily increased and actually reached the one per cent target. It is a matter of irony that after the solemn declaration about the target, financial transfers to the poor countries should have fallen

to 0.7 percent of the combined national income of the rich countries. While international trade has expanded rapidly, the share of the poor countries has steadily fallen from 27% in 1953 to 18% in 1968. The Kennedy Round has boosted trade among the rich, to him that hath, more will be given, while through tariffs, quotas and other non-trade barriers both the quantum and terms of trade have diminished for the poor countries, from him that hath not, even the little that he hath shall be taken away. These countries have not been able to earn their way through increasing their exports to pay for the imports needed for their development. And finally, the poor countries have not made the internal institutional adjustments and changes which can make development a part of their national life – assuring equitable distribution of the fruits of development, developing increased sources of savings and changing the social structure, education, birth rates and the political frame-work for popular participation and decision making.

The Second Development Decade.

Against this record of gains and set backs, the nations of the world have launched the Second United Nations Development Decade. On the 25th anniversary of the United Nations, 24th October 1970, the 127 Nations General Assembly of the United Nations solemnly proclaimed the second decade starting from 1 January 1971, and reaffirming the programme for the full implementation of the declaration on the granting of independence to colonial countries and peoples, adopting a declaration on the principles of International Law concerning friendly relations and co-operation among States, reaffirming the declaration for complete and general disarmament, adopted the following International Development Strategy for the Decade.

The poor countries will plan for an increase in their growth rate of at least 6 per cent, keeping the population growth to 2.5 percent, so that their per capita growth will be 3.5 per cent. The rich countries will aim at a 4 per cent growth, involving a 3 per cent per capital increase. Thus the gap between the rich and the poor will cease to widen. The poor countries will increase their agricultural production both in their wet and dry lands by 4

percent a year, which together with land reforms, will feed their growing population, improve the nutrition of the poor section and ensure the countries' growing industrial raw material supplies. Industry in the countries must expand annually by 8 per cent. A savings target of 20 per cent of the total production, mainly through restrained consumption must be reached. Trade exports and imports, should be expanded at about 7 per cent per annum. A planned employment policy using their comparative cost advantage in human resources should be formulated and executed.

Education and training in all forms should be improved and expanded which together with a push in research and development will involve an expenditure of 5 to 6 percent of the national product. A well rounded and effective population control programme will be followed, aimed at decreasing population growth by 1/2 percent. The countries will promote legislative reforms, development attitudes, motivation and popular participation in the entire development front.

The rich countries will support the development efforts of the poor countries primarily through increasing the volume of trade from the poor countries and improving their terms. They will give the imports of primary products, manufactures and semi manufactures from the poor countries preference, raising no tariff or non tariff barriers against them. It is good news that the Six Nation European Economic Community has just given effect to this decision. Commodity agreements, financing of buffer stocks, surplus disposal and development of synthetics will be so managed as to ensure stable prices for the poor countries' exports. Shipping and insurance costs will be reduced and the heavy debt burdens rescheduled. In the aid field, a target of one percent of the gross national product has been agreed upon by each economically advanced country to be reached by 1972 of which 70 percent, instead of the present 26 percent is to be in the form of inter-governmental aid, consisting of grants and soft loans. This total effort by the world community in the Seventies will continue and enlarge the fight for the development of the poor countries.

Role of Youth : What is the stake and stand of youth in the Development Decade ? Development and Youth are coterminus.

In speaking of development I have been speaking of youth. Development is youth and for youth. Development is growth which is youth. Development is change like youth. Development like youth, is growth plus change every day and in every way. Hence I would describe the role of youth in the Second Development Decade as being awareness, participation, preparation and contribution.

Awareness: The development issues, as we have seen them, are to do with the life and death, the welfare and ill-fare of two thirds of the human race and more generally of the whole of the human race. There is a vast array of technical problems of development which must be studied, analysed and understood. No one should plead ignorance, least of all youth, of these vital issues. All youth organisations, all schools, universities and out of school educational programmes must provide an opportunity to young people to understand the problems of savings, investment, capital output ratio, trade quantum, terms and barriers, aid targets and performance, the agricultural transformation both in the green revolution and dry farming areas, the population crisis and the content of family planning, the nutritional problems and delivery systems of protein rich foods, the regeneration of the education system, the urban explosion, the nature of unemployment and underemployment, the need for social justice and redistributive mechanisms to be built into economic growth programmes and above all an understanding of the purpose of all development. Development is a means to an end. The end is Man. Man is also the instrument of development. And so it is so easy to confuse the purpose with the instrument, the glitter on the spoon with the nature of the food it serves. In all countries, rich and poor, we face this very real danger–the danger of subordinating Man, who is the purpose of all development to man, as the instrument of development. That is the basic reason why we have the poverty crisis in the poor countries and the pollution crisis in the rich countries. That is why we have the unemployed youth in the poor countries and the revolting, disgusted youth in the rich countries. Youth must keep alive the central and cardinal truth and purpose of all development—that it is to serve man and his entire being, physical, mental and spiritual. Youth's aware-

ness of development can help the world reject any programme or plan which subordinates man and his ineffable being to other ends.

Participation : The development challenge and programme are not just for a decade. They are with us for several decades. The strategy that I have described is for the Seventies, but the questions that it raises have to be continuously posed and answered. Whose development, for the rich or the poor? What kind of development, for man or for prestigeous record? For whom is the development, for youth and the coming generation or for the past and present generation? Which kind of world should development lead to, a world of peace and growing peacefully or one armed to the teeth and playing at brinkmanship, neo-colonialism and brush wars? What kind and how much trade and aid would lead to development and not colonialist relations ? How is development to be attained, by what stages, what priorities, what instruments, what institutional changes ? What kind of education does our world—*rich or poor*—need? The answer to these broad issues, the choice of options will determine the development of both the poor and the rich countries. The questions that I have posed are not self answering nor are the choices pre determined. All choices are open and all options for development are there demanding decision.

At present these decisions are being made by the political leaders of each country who are usually on the wrong side of 60, advised by scientists, economists and technicians who are also on the other side of 40. I know that youth is not simply a matter of years, but a state of mind, Yet the two must go together. Youth must participate in development policy discussion and take their place in all development decision making. For after all it is their lives, their future, their well being that are being decided. If in political democracy we have left behind all archaic and reactionary restrictions of property, age, birth, sex and educational qualifications as proof of political maturity, so that today all people can decide freely what kind of polity they want, it is high time that in all development policy councils and in all instruments used in making development decisions, youth representatives be an integral part. Internationally the great youth organisations are associated with the United Nations system in

formulating the International Strategy and monitoring its execution. At the national level, national youth bodies should be a consultative organ, helping the Planning Commission formulate its development strategy decide on the country's priorities, and monitor the execution of programmes. At the district and village level the local youth groups should be members of the committees and councils responsible for project formulation and execution. Such informed and active youth participation in development planning and programming is essential if the purposes of development are to be attained.

Preparation : Development demands preparation by and of youth for the urgent tasks awaiting them. This preparing oneself to be an engineer or an agronomist, a doctor or a farmer, an economist or a plumber, a manager or a cattle and dairy technician, a skilled craftsman or a planner, a teacher or a youth organiser involves long hours of learning, and in today's explosive increase of knowledge and information turn over, learning not simply the substance of the subject, which is changing rapidly, but learning how to learn. There are of course the exceptional boys and girls who run away from school and become national or business leaders. These are not only exceptions but in today's specialised and fast changing world, anachronisms. The development call to youth is resoundingly clear. It is to prepare oneself patiently and thoroughly in school and college, in farm and factory to play a meaningful role in increasing food production, diversifying and creating employment, improving nutrition, helping to contain population, recreating some kind of balance between man and his environment and above all learning to live in understanding, tolerance and charity.

Contribution : Development cannot wait. It is here demanding action in each of our countries. It is today, whose demands cannot be put off tomorrow. There are a host of development contributions that each youth group can and must make. They can flow from a range of youth motivations, ranging from a love of adventure or ideology or service and healing on to friendship and a counter to military service and youth frustration. During their summer vacations and evening hours, youth groups and

individuals can contribute to development: by building village schools with local materials, by acting as para medical personnel to the rural and urban clinics for family planning and protein enriched food distribution; by working with small and dry farmers in land levelling, land development and moisture conservation: by helping to clean up our villages and towns and so preventing man who is the greatest pollutant from polluting his environment further: by creating and strengthening public opinion in favour of development; by organising and running adult literacy and education programmes so that the illiteracy and miseducation barrier to development is reduced. Development offers a whole host of practical and urgent activities calling for your contribution and collaboration.

CORRESPONDENCE

Letter from Dr. C. T. Kurien in reply to Mr. Sampath's

Note on " Problems of Suburbanisation ".

I am very grateful to Mr. Sampath for taking an interest in my paper and for raising some questions about the procedure I had adopted. (See A Note on "Problems of Suburbanisation" by Mr. R. K. Sampath in the November 1971 issue of the *Bulletin*). It provides an opportunity to clarify some points although I do not believe that any of the three problems that Mr. Sampath raises in the Note affects my arguments or my hypothesis. Let me take them up one by one.

1. Differences in the definition of "urban" adopted in the 1951 and 1961 Census Reports :

Mr. Sampath says that the figures I quoted for urban growth between 1931 and 1961 "differ significantly" from Bose's "adjusted" figures. Since the issue is really about 1951 and 1961 I give below my figures (taken from the Census Report) and Bose's "adjusted" figures for these two years ;

Percentage Variation in population during 1951-61.

Class of Towns	*Kurien's figures from Census Report*	*Bose's adjusted figures*
Class I	+ 48.0	+ 48.0
Class II	+ 25.0	+ 27.0
Class III	+ 41.7	+ 40.5
Class IV	+ 20.5	
Class V	– 25.5	–7.2 (Classes IV–VI)
Class VI	– 57.3	
All Towns.	+ 26.4	+ 37.7

Apart from the difference for "All Towns" and the fact that Bose clubs together classes IV to VI, I do not see any "significant difference" here. Mr. Sampath also misses the point that I was stressing that the "instantaneous method" used by the Census (and by Bose) is not of much help to understand the growth of particular towns (such as Tambaram and Tiruvottiyur for which I obtained figures from the concerned municipalities).

2. The relation between suburbanisation and industrialisation.

Mr. Sampath says that "available data do not support Dr. Kurien's second hypothesis that industrialisation accounts for the existence and growth of suburban towns". Here I must make two observations:

(a) My hypothesis can be understood only if it is taken in its totality. It includes my refutation of the usual hypothesis that suburbs are related to the primary city in terms of a territorial and functional differentiation (my first hypothesis). The second hypothesis must be seen in relation to the first one.

(b) In my second hypothesis I used the word industrialisation within quotation marks and in fact referred to it as "industrialisation" defined in a broad sense. Elsewhere in the paper I have questioned the adequacy of classifications such as agriculture and industry, which was another of the main questions I was raising. Also it was very much a part of my argument that the problems of *sub*urbanisation are different from the problems of urbanisation in general. Hence the absence of correlation between industrialisation and urbanisation that Mr. Sampath points out does not affect the validity of my hypothesis. This leads me to Mr. Sampath's third point.

3. Mr. Sampath says: "One important omission in Dr. Kurien's paper is that it does not deal with the real factors that affect this growth of urban population explicitly" the most important of which according to him is the natural increase in population. He is quite right, but the omission is deliberate. I was not concerned with the factors that affect the growth of *urban* population. And if Mr. Sampath had looked at the figures I had given, it would have been clear that the growth of Tambaram and

Tiruvottiyur (Tambaram : 80% between 1951 and 1961 and 64% between 1961 and 1971; Tiruvottiyur : 68% between 1951 and 1961 and 146% between 1961 and 1971) just cannot be explained in terms of natural increase in population! The growth of these towns is clearly the result of in-migration. The only question is where the migrants have come from. The traditional view is that since these towns are the suburbs of Madras they have come from Madras; and I say more likely from places other than the city itself.

These issues cannot be settled by theoretical arguments or by using all-India or even all-Tamil Nadu figures about urbanisation. Only the study of the actual situations can give us the answer. My plea is that we should not use Western generalisations in our context without verifying their empirical validity, and I am sure Mr Sampath will agree with me.

* * * *

From Mr. Ward Morehouse, Educational Resources Centre, P.O. Box 423, New Delhi-1. Dated 9 October 1971.

American life is largely urban. And even when it is rural, urban forces impinge on rural life. This gives rise to a host of environmental and psychological pressures which are taken for granted in the U.S. When American students are taught about the city and its problems, they tend to feel that these problems are unique to their own culture.

One of the key assumptions in courses of urban study is that man's problems with space and shelter are everywhere equally vexing and equally important in moulding, to some extent at least, his outlook on other men and peoples. The moral and spiritual components of his nature are deeply modified by the environment in which he lives. Satisfaction, fulfilment, adjustment, harmony are basic needs of human life. Living conditions in cities affect these elements crucially. In the U.S. the terms "ghetto," "slum blight," "destruction of neighbourhoods," "air pollution,"

"public transportation," "city services to the poor and minority groups," are cliches so much so that American students tend to think that the problems these terms represent are of concern nowhere else. This belief needs to be dispelled if the American student is to have some notion that there are as many problems for man as there are different ways to his life. There are indeed as many different ways to life and living as there are men and communities and each in its own place is valid. This cannot be taught intelligently without comparison with other ways of life.

Because covering all aspects of urban problems thoroughly would be a vast undertaking, we have decided to limit our study materials to one aspect of the problem—housing. In order to dispel the idea that the apartment building or the wooden or stone house of the United States is the only acceptable dwelling, the unit will be entitled "providing Space and Shelter for Urban Populations." The City in Madras has been chosen as the city to be studied in depth with comparative examples to be included from Delhi, Calcutta, Poona, Bombay, and possibly Bangalore.

The finished unit will attempt to use a group research or problem-solving approach to the need for space and shelter. Tools for problem-solving will include census data, figures on rates of migration at various seasons and similar published sources, and interviews with officials and inhabitants of various sections of Madras, including those living in squatter colonies. Some of the material from interviews will be used as the basis of a series of case studies of various sectors of the city. Others may be duplicated on tape and used in their original form.

The completed unit is expected to be used in American college course on urban problems, economic development, urban sociology, and Indian studies. A student or group of students will be given the collected data and references to selected books and journal articles and asked to recommend a set of programmes involving space and shelter, taking account of available resources. After the student plan has been produced, the student or group of students will be required to compare the suggested plan with that actually developed by the City of Madras. The same type of

approach will be utilized to study the same problem in Morocco, Tunisia, Yugoslavia and the United States.

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Letter dated 8 October 1971 from Mr. M. Narasimhulu, Technical Assistant, Department of Economics, Osmania University, Hyderabad.

This is in continuation of our letter dated 27th August, 1971. We are happy to inform you that we have gone through the research problem of Mr. H. Venkateswara Rao, which you have published in our Journal (Published by Madras Institute of Development Studies).

I am happy to inform you that the third meeting of our group was held on 26th September, 1971 at the New Science College. I presented an outline of my research work and there was useful discussion on it. Mr. T. Suryanarayana Rao presided and besides myself Messrs. Dr. M. Nagaraja Rao, Mr. H. Venkateswara Rao, Mr. T. Suryanarayana Rao and Mr. Nandedkar attended the meeting. The note presented is enclosed herewith.

*   *   *   *

Proceedings of the 3rd meeting of the Research Team of Osmania University (who have attended the Summer Workshop in Research methodology at Tambaram, Madras) which met on 26th September 1971 and discussed the Research outline of Mr. Narasimhulu.

The Following Members were present

1. Dr. M. Nagaraja Rao
2. Mr. H. Venkateswara Rao
3. Mr. Nandedkar
4. Mr. T. Suryanarayana Rao
5. Mr. M. Narasimhulu

Mr. T. Suryanarayana Rao was in the Chair.

Mr. M. Narasimhulu presented his Research outline on "the Fiscal Policy for planned Development". The main objective of the study is to frame a fiscal policy which is in consonance with the long term optimum Development Strategy that the country should follow. It is stressed that the role of fiscal policy is not to raise revenue as was erroneously thought of by classical writers on public finance. The role of Fiscal Policy is to give incentives and disincentive for investment in approved and non approved fields.

The conceptual and methodological issues involved in the analysis were discussed by the members.

The next meeting of the group will be held on Saturday October 9th 1971 in the New Science College at 4 p.m. Mr. Nandedkar will present a paper relating to his research.

The outline of Mr. M. Narasimhulu's presentation is given below:

1. *Title* :

" Fiscal Policy for Planned Development "

2. *Statement of the Problem* : Literature on Fiscal Policy is not lacking but the approach suggested in the existing Literature is out dated. Fiscal Policy has to be framed with reference to the stage of economic development that a country is currently undergoing. We cannot use the fiscal policy designed for a golden age full of employment Economy, to an economy which faces the problems of unemployment. When our economy like that of India selects heavy Investment Strategy as the Optimum one, we have to use the Fiscal Policy to achieve the objectives of Heavy Investment Strategy. On the other hand, if mechanised light machinery strategy is followed, we have to devise a different fiscal policy. In short, the aim of Fiscal Policy should be to see that there is no deviation in any field of the target. If any deviation exists, we should utilise Fiscal Policy to correct it.

3. *The objective*: The objective is to frame a suitable tax structure (which is a part of Fiscal Policy). The suitable tax seems to be the one which is termed as Disparity Tax. The Disparity Tax consists of Four Schedules. They are:

1.	Schedule	A	to	penalise	deviation	from	approved	ownership.
2.	,,	B	,,	,,	,,	,,		earnings.
3.	,,	C	,,	,,	,,	,,		Consumption.
4.	,,	D	,,	,,	,,	,,		*Investment.*

We are interested in accelerating economic development, for which rapid industrialisation is essential. To achieve this, we have to build up the Heavy equipment base. It means that we should see that whatever Heavy equipment we produce, we should use it only for its reproduction; it should not be used for the production of light machinery. If any industry is deviating from this objective, we should devise a fiscal policy *which corrects the* deviation. For example, at this *stage of development of our* country, we should not produce *luxury consumption* goods such as airconditioners tape recorders, small car etc., as these industries require the Heavy equipment as input. We have to penalise these industries through higher taxation. Contrarily, we have to encourage H-conserving industries. Through fiscal policy we have to control the luxury and undesirable consumption.

4. *Methodology*: *Use of the tools developed by Prof. Gautam* Mathur.

5. *Hypothesis/Assumptions*: (a) It is assumed that planning is essentially a centralised process and any effort to overemphasize its decentralised aspects will inevitably lead to the postponement of the declared objectives :

(b) only Fiscal aspects of the plan are considered in this study;

(c) It is assumed that H Investment strategy is the optimum one for the long term economic development of our country.

Articles published or approved for publications :

1. "Fiscal Policy for Planned Development" read in the Summer Workshop on Research Methodology in Economics at Madras.

"THE WORLD OF BUSINESS AND THE WORLD OF RESEARCH"

By

MR. S. NARAYANASWAMY

Vice-President,

Southern India Chamber of Commerce, Madras.

In India, the word "Research" appears to have a different meaning for our scholars and post-graduate fellowship holders from what the word connotes outside the country. By the same token, the layman's concept of a Research worker is quite at variance with what people at large in other countries believe that person to signify. The Research man believes that his job, when in dedicated pursuit of truth and when seeking to find a key to unlock the secrets of nature, requires that he be left undisturbed to do a job, preferably with equipment of his choice and cut himself from the main-stream of the work-a-day world in order to ensure the required mental concentration. He has debated with fellows of similar or sometimes inferior calibre, the relative merits of pure and applied research and is inclined on balance to be strongly suspicious of the businessman, whom he regards often as a rapacious person running after profits and who does not want to pay for research findings an appropriate price.

The layman's concept of a Research worker is that of an unkemptly-apparelled, dreamy-eyed introvert, who is only at home behind his study table and who, while living in near-total oblivion of fellow mortals, is reluctant to share the outcome of his years of arduous labours, with the rest of the world—including that small part of it, which can benefit the world when implemented. Indeed the Research man in India reminds the people of himself and his mission, through occasional articles in the daily Press. What he writes in technical periodicals is read only by fellow scientists or Research men. People engaged in Life's strenuous action, get the vague impression of unappreciated

discoveries and poorly-assessed human material. Further the exasperating spectacle of a bureaucrat sitting in judgment over Research findings which are poised for large scale application and taking negative decisions, has injected pessimism into all research work.

We have been slow in curing our own under-development and we have done some psychological self-flaggelation through seminars and symposia in trying to identify the causes for our backwardness. We have research men justifiably filled with complexes because they have not been able to communicate purposefully with those who can help them to translate their findings into the needed goods or services. Men of talent cannot subsist alongside of negligible opportunities for the exercise of their talents. They should not be forced to deploy their energies to composing film lyrics because these latter have a better market. It is small wonder, that the research men have become introverts, with a defensive wariness about all they say and do.

On the other side, we have the bread-and-butter world of consumers, schooled in scarcities and high prices, deeply soured over the struggle to balance budgets. The consumer is almost fully persuaded that we are fast shifting from an era in which a citizen carried a purse to the market and brought home a basketful of groceries, to an era in which he will carry a basketfull of currency notes and bring home a purseful of groceries. He believes that neither government nor those who operate science and technology, will help to stem this high-tide of inflation, any more than they could do it in the past 25 years of freedom, during which they talked endlessly of development. Of consumer-orientation of anything in the economy, there has been little, except the advertisement material. His opinion is that neither limericks nor cartoons nor pictures of charming women swearing by their favourite beverages is necessary to sell goods that are by and large unavailable and this vast expenditure could be curtailed if only for effecting a reduction in end-prices of goods sold. The consumer in India, of whom flattering things are said, starting from his being described as the king, has gone the way most kings and princes have gone. John Stuart Mill called the consumer

"the forgotten man of political economy". Alas! in a world in which statements have gone obsolute, this one has an unwelcome evergreen-ness.

To summarize the present situation as among the three parties involved in this debate, namely the industrial producer of goods, the Research-organiser or institute and the consumer community: it does appear as if the industrial producer is sitting on the peak of one hill and the research man is sitting on the peak of a neighbouring hill, with the consumer community subsisting in the valley in between, fearful of land-slides and avalanches. Each of the hill-top groups gaze at the other through field-glasses and feel rather self-important and less and less disposed to get together. Now the consumer and Governments at State and Central levels have begun to feel that they must do a measure of organizing to bring both groups to the valley of the consumer in order that both may meet the consumer and know his exact needs. Thereafter, the Research Institution will bend its research in that direction to help the starved consumer to get his requirements in plenty, while the industrialist will be helped to produce goods of minimum acceptable quality at prices that will have some parity with people's purchasing power: the Government will also get involved in deciding how much excise duty or sales tax levy the consumer can stand—even as Governments seek funds in the name of economic development.

Recent efforts to get the Research men and industrialists together, have met with a fair measure of success. Indeed during these occasional meetings, the industrialist has been pleasantly surprised to find that the Research men are not really the absent-minded, pinznez-wearing homosapiens who, when they entered restaurants, kissed the butlers and handed in tips to their wives; but men who are engaged in some down-to-earth jobs; and in many cases, could have been helped and directed to do process inventions that would have saved the industrialist and the country, royalty and engineering fees paid in U.S. dollars, Swiss francs or Pounds Sterling—which are getting expensive even as we repay existing loans, because of revaluation of some of these currencies. The Research man for his part, is finding the industrialist is not exactly a mammon-worshipping incorrigible; nor quite that semi-

literate, culture-bereft person, who flaunts his bank balance on the windscreen of his luxury car—but a hard-working man, who is willing to take help and listen to advice and who often admits his mistakes; and who is prepared to dispense with external collaborators, where this can be done without serious prejudice to his shop-floor efficiency. This removal of psychological barriers, which has been achieved through frequent latter-day meetings and by reason of governmental efforts to import meaning and content to the work that goes on inside of these expensively-equipped C.S.I.R. units, is a major gain for the country. But we need diligent and painstaking follow-up action—that requires patience, a willingness to trust a fellow Indian to produce results in at least some proven spheres and a perennial awareness of the poverty levels in the country, even as we seek to engage in poverty-abatement programmes.

It is heartening to know that in the field of Agriculture that accounts for over 50 percent of India's G. N. P., the benefits of research on wheat and rice, have resulted in larger production of disease - resistant varieties: that in the fields of sugar-cane, tobacco and cotton-growing, agronomist's expert advice has been acted upon with gratifying improvement in quality: that the findings of our Forest Research Institute in Dehra Dun have helped us with solving the ticklish problem of re-afforestation. But we are told that there is a long way to go in these very fields—with our adding a million mouths a month to India's consumption capacity.

In the field of industrial consumption goods, we need intensive research in two fields, at least one of which boasts of well-established research facilities. One is cloth and the other is house-building. We have two big research centres built up by the Textile Industry—the ATIRA in Ahmedabad and SITRA in Coimbatore, both captained and manned by persons of accepted credentials. What we need to do research on today and bend all apparatus towards is : how and where we can cut down costs in industries and prices to the consumer. The Indian consumer is a person whose capacity to create effective demand for goods or services is by and large proportionate to what farm surpluses his agricultural labours will create : and what prices he can get for his farm produce : and whether he can cut through the

jungle of rapacious intermediaries who dragoon him into accepting a low threshing-floor price for his produce and make profits beyond their deserts, merely, because of the financial liquidity they command. If we can do some research into this major problem of cutting down on the number of intermediaries in our agrarian economy and where intermediaries cannot be eliminated, that can be done to reduce the profits or commissions of such intermediaries, with a view to enhancing threshing-floor prices realized, we shall create large purchasing power in our villages. The Co-operative Society has proved a disappointing answer here, because of not infrequently, men of poor character, who have otherwise no ostensible occupation, gate-crash into and clog the co-operative movement, through adroit use of their political influence. Case studies must be conducted in both river-fed and monsoon-dependent cereal-growing areas to find out how much diversion of legitimate rural incomes takes place, through the influence of financing intermediaries and what can be done to increase the agriculturists' bargaining power in India. Variations in conditions of Indian Agriculture preclude the possibility of overall standard practices, but it is very important that we begin all our consumer-oriented research with an attempt to increase rural purchasing power. The cash crop growers like those who cultivate sugar-cane, groundnut, tobacco and cotton, have more sophisticated and less wasteful marketing arrangements (indeed the sugar-cane grower supplies to the factory direct) and here they have always had larger profit margins and they are not easy to exploit.

The consumer in India has been carrying on a frustrating battle to secure goods of reasonable, if not top quality and at prices that would be within his reach. Over the last twenty years, trials and errors, help from foreign collaborators, and experience with differing raw materials, have toned up quality in many lines of consumer goods. The emphasis on export promotion led to a realization of the paramount importance of our meeting the exacting quality demanded by foreign consumers of India's goods. Several such factors have forced the Indian manufacturer to improve the quality of the goods he produces. However, research has therefore not played a significant part, in achieving quality in manufacture. Indeed the outcome of external research as piped in through foreign collaborators' processes, has played a bigger

part in achieving quality in India—to the extent it has been achieved. What is important today is that we achieve import substitution of raw material that is presently imported into the country—through the Research outfit available in the country. Some fine instances of such substitution on a large scale — are the substitution of copper by aluminium in cable-manufacture, which has saved India enormous foreign exchange in twenty years and the manufacture of cellulose fibre for the synthetic yarn industry—like rayon, staple fibre and the newer patented fibres. Indeed we are importing scarce metals like zinc and lead and scarce materials like sulphur and graphite for our fertilizers and electrodes. While there is general agreement that a country need not aim at total self-sufficiency in raw material or consumer article there is need to give a new sense of direction to all our research. In any case, for many years to come, Research with the objective of immediate application of results achieved, should be our clear policy. Such spectacular results have been achieved by American and West German Research Centres because they are by and large, wings of mammoth industrial units, like Du Ponts, General Motors, American Telephone and Telegraph in U.S.: De Mag, Bosch or Siemens in West Germany. The industrial units come across problems of raw material, processing, strength-testing or saving in material used and so on and they hand over a specific problem or project to the Research unit. This is as it should be and may be called industry-orientation — which, in turn, is concerned with satisfying the consumer by producing goods he seeks, of quality he likes and at prices he would cheerfully pay.

In India, our industrial units are in most cases, of middling-size and are not such as can invest the large sums needed on sophisticated research, which call for expensive equipment. Only the very top Companies of which we have a handful, can establish research units that would deliver the goods. We have on the other hand, a fair assortment of National Laboratories, which are fast getting reasonably equipped, to which industry can hand in specific projects. These may cover shift in raw materials to substitute imports: elimination of intermediate processes which can save costs; new processes for basic manufacture in place of cumbrous old ones: refining of material, finishing processes and generally, cost-slashing ideas, which are very important for the country.

The present atmosphere of suspicion and hesitancy that characterises the relations between Industry and the National Laboratories that operate under the C. S. I. R., should be replaced by one in which the industrialist takes his problems without any inhibition to the relevant unit of research; and the C.S.I.R. undertakes a campaign of publicity among the industrialists as to the facilities available at the National Laboratories. Indeed in a country in which entrepreneurs are few and such as there are, are drawing their horns in, because of taxation burdens, it is essential that the National Laboratories should go all out to sell their processes on reasonable terms as to royalty or know-how payments, in order to induce the new entrepreneur to utilise the products of research.

It is not necessary to apportion blame for this peculiar stalemate, which has followed lack of communication between the research man on the one hand and the man who commands the machinery for implementing the research findings and converting them into reasonably-priced goods and services, on the other. We can make a start now, by widening the communication channel, by breaking all psychological barriers and by convincing both the Research man and the industrialist that only a combination of the intellectual attainments of the world of science and the organizational competence and energy of the industrial entrepreneur can rescue the consumer from the prison-house of scarcities, shoddy material and conseqential under - consumption in which he functions now.

The effort calls for patience and free communication unchoked by prestige. From classical times, the consumer has been anointed and crowned as king and he has been resigned to it as harmless histrionics. He now asks that as a tax-paying citizen, he will be supplied the modicum of goods and services that will make life worth living. Is it too much to ask that Industry, Agriculture and Research may get together in a purposeful endeavour to produce goods and services which would be within his reach, even if possible to meet his tastes. The effort, the organisation and the removal of psychological barrior involved are a small sacrifice, in our overall achievement of poverty abolition.

UNIVERSITIES AND INSTITUTIONS

By

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1. Scope for Research :

India is a rapidly developing country and her industrial growth during the last two decades necessitates the adoption of new techniques that would go a long way to put her industries on a par with developed countries. It must be accepted that though the country has witnessed three Five Year Plans, the industrial development does not seem to keep with the tempo of development seen in Japan, U.K. or U.S.A. Japan, particularly, has achieved a very high rate of industrial growth (of 16%) within a short period. This is particularly because of the increased effort of the Japanese people to make the country progress at a very rapid rate. Judged by the Japanese standards, India has to go a long way. Many measures have to be adopted to make the nation realize a higher growth-rate. Increased adoption of techniques such as Operation Research and Systems Analysis will make our industries highly efficient.

To-day, our industries are facing many problems. There is a steel famine threatening to starve our engineering units. When compared to U.S.A., which produces as much as 123.5 million tons of steel a year, and U.S.S.R. which produces nearly over 106 millions of tons of steel, India produces a meagre quantity of 6.5 million tons per annum. If the industrial development has to proceed rapidly, the production of steel of all types has to be increased considerably. In fact, steel planning has to constitute the basis of economic planning. Further, there must be a proper coordination between steel planning and steel-plant-equipment-planning. Otherwise, the concerns engaged in the manufacture of machineries for steel plants may find it difficult to fix up their production schedules and deliveries. For example, the Ranchi

Heavy Engineering Corporation, set up with the objective of producing capital equipment for one steel plant of one million ton capacity per annum, has not been able to do so and this is particularly because of absence of coordination. This is an important area where research on demand for steel and demand for capital equipment will go a long way to solve the problem. Thus, a proper approach to steel planning involves the finding of solutions for the various problems of the industry relating to the demand, supply, equipment, marketing, movements etc. Moreover, to get the new Salem Steel Plant into early operation is a problem which can be analysed so that early benefits can be got for Tamil Nadu. How best all these could be done is a problem for research.

The sugar industry with 6 units and a production capacity of over 3½ lakh tonnes is an important area for research. The surplus sugar output of Tamil Nadu has to be disposed of in the Bombay, Calcutta and Kerala markets. This brings with itself the problem of transport which works out to about Rs. 10 to Rs. 12 per quintal of sugar moved to the (North India) markets. The problem of marketing surplus sugar is a matter to be gone into and the industry will have to be given suitable assistance to increase the production as well as to bear higher marketing cost. A comparative study about the operative efficiency of the sugar factories in this State with those in other States is essential for establishing the nation's economical productive capacity. The possibility to run the factory for over 250 days in a year is a definite advantage for Tamil Nadu. How to increase the recovery of sugar by resorting to a study of irrigation pattern in Tamil Nadu as well as in other States is another important area for research and enquiry. Also, aspects like the better utilization of the by-products such as bagasse and molasses have to be taken up for detailed investigation. Many of these problems require a thorough and deep study and Institutions and Universities, which are engaged in research activities, can take up any one of these problems and thereby give a practical bent to them.

The textile industry is in doldrums. Most of our mills are not modernised. Again, we have more spinning units than weaving units. The raw materials for the industry have of late become a big problem. Our mills have to depend on cotton from Bombay

as well as from imported areas. The transport cost of moving cotton from the Bombay to the mill adds to the cost of raw material. Most of the spinning mills need modernisation. Further, the yarn produced in Tamil Nadu is to be sold in Bombay market because of the presence of large number of weaving and power looms in that area. This means a heavy burden of transport cost. A modernised spinning mill located in Bombay has a special advantage over a unit in Tamil Nadu as it does not incur heavy transport cost of cotton and yarn. The problem here is to get the industry move into a successful pattern. Such problems, as creation of new weaving capacity, increase in the number of powerlooms and adoption of finishing processes, are matters for research and study. Everyone of these items by itself may constitute a subject of a separate study. If Universities and Institutions of research do not undertake such studies, who else can do it?

Some of our industries, particularly the textiles, suffer from an inadequate supply of spare-parts and raw materials. All industries may not be in a position to guarantee a stock of heavy spare-parts. They have to be stocked in a central place. The same is the case with raw materials. For example, in Coimbatore it is easy to have a Central Organisation to stock the required spare parts. This should automatically mean less overheads for the factories. The consumption pattern must be studied and on the basis of this study an assessment of the required raw materials can be made. This will help the maintenance of buffer stock of spares and raw materials.

In the case of the textile industry, cotton can be stocked in a central place. The mills need maintain just two weeks' stock. A cooperative organisation can be started by the various mill-owners for the purpose of purchasing and stocking the cotton required by the mills. It may be cheaper to hold raw materials in this way. Again, it may also be scientifically advantageous. Thus, for every industry there are problems relating to the supply of raw materials. The associations of the respective industries have to take up this problem of regular supply of raw materials. Universities and Private Institutions engaged in research, can take up raw material-storage and spare-parts-stocking as their subjects of study.

In Tirupur, there is a highly centralised hosiery industry. Its export potential is of a very high order. But it has yet to evolve a proper marketing organization. Various aspects relating to the marketing and sale of hosiery products have to be properly investigated and studied by institutions and universities.

The foundry industry is highly centralised in Coimbatore. In fact, Coimbatore supplies more than 40% of the nation's requirements of motors and pumpsets in India. Research can point out other areas where this highly skilled personnel and foundry equipment can be used. A separate institution called the Foundry Research Institute may be established at Coimbatore for tackling the various problems relating to the diversification of skill, marketing of output and exploration of export potentialities relating to this industry. Also, private institutions like yours can take up this problem for research.

Auto-spare parts is another area where there is considerable scope for research. Demand forecasts, revealing the requirements of auto-spare parts, the durability of spares, produced by the firms which are engaged in the production of such goods, and the problems relating to such products are fields of study which can be effectively done by students of Mechanical Engineering in our Engineering Colleges.

Medicine is another field where the scope for research is very wide. A number of pharmaceutical concerns produce a wide variety of products. These are sold purely on the basis of advertisements and salesmanship. The comparative merit of each product can be determined only through studies, conducted by research institutions. In the U.S.A the output of pharmaceutical concerns is a matter for study in medical colleges and other institutions. Moreover, problems relating to nutrition can also be taken up for research and analysis.

2. **Operation Research :**

Operation Research is an important area where there is considerable scope for activity. Developed by U.K. and U.S.A. during the II World War, for their research studies on military operations, OR technique is now adopted on a large scale by the

business units all over the world. The introduction of electro-data-processing-methods and the advent of digital computer further increased its scope and today many industrial concerns are adopting OR as an integrated decision-making-contrivance for their routine decision procedures in production planning, marketing strategies and maintenance of inventories. To increase profits, a sale-cum-production study will have to be made. This implies an assessment of demand as well as supply aspects of production. Similarly, for a good sales programme, a production schedule has to be worked out at an economical cost. For all these the OR technique is an ideal device.

Planning of service facilities and availability of man-power is essential for industry. Beyond a certain limit, excess of certain factors may become uneconomical while facilities of manpower may cause bottlenecks. For example port authorities are always anxious to plan the number and size of berths and the loading facilities. In the same way, airport authorities will have to provide landing ground of different lengths at different termini. The queuing theory is an integral part of OR technique which will enable us to solve these problems. For operating transport services profitably, an optimum schedule for vehicles and cars will be essential. By resorting to OR techniques many such bottlenecks can be overcome. Above all, national planning can be suitably improved through an optimum coordination between the Central and State Planning agencies. By forecasting occurrences of bottlenecks and evolving an optimum coordination of various draft proposals suggested by different State Planning Commissions, the Central agency can achieve a more promising plan for the nation. The weapon used for achieving such a coordination is OR technique.

3. Hurdles to Progress in Research :

There have been some hurdles to the progress of research in institutions and universities in India. In the first place, a critical study of the conditions of research conducted by Universities and research institutions will reveal that there is a total absence of a proper dialogue between industry and research institutions. Until and unless a close liaison is established between the industries and

research institutions, nothing substantial can be achieved. In short, research has to be industry-oriented. If research is not properly industry oriented, most of the findings of the research institutions may not be used. Instances of findings being shelved, by not only those who are concerned with it but also by academicians, are quite common in India. In U.S.A. and U.K. research institutions are structurally adjusted to meet the requirements of their industries. Secondly, paucity of funds is a factor which imposes a hurdle on the activities of research institutions and universities. For instance, a qualified scientist or an Engineer, if he should be properly utilised, involves an expenditure of Rs. 50,000 to 1 lakh for an establishment. What is more, half of the value added by the industrial sector is still accounted for by the small scale sector and nearly 92% of the funds belong to this sector. In that event, many of our industries will not be in a position to afford research, Thirdly, our research output is not commercially viable. It has been estimated that out of 1482 patents, taken out by the CSIR only 150 have been commercially exploited. This is a serious lacuna with regard to the research activity in this country. Fourthly, our Universities rarely involve themselves in any useful research for society. Those who are engaged in research work, waste their time and energy in taking up obscure subjects which are mostly antiquated in their content and scope. Students of economics for instance, choose subjects which have nothing to do with day-to-day problems. They often ignore the current problems and concentrate on past development. Economists can take up for their study such subjects as under-utilisation in certain industries and find out the cause for such under-utilisation of capacity. This will go a long way to solve the various problems which some of our industries are facing. In the spun-pipe industry, for example, there is a wide gap between installed capacity and actual production since 1966 and this gap has widened during the last 3 years or so. Moreover, the projections made by the Planning Commission and the NCAER, regarding the demand for spun pipes, by the end of Fourth Plan, have not been correct. In fact, the demand has not picked up at the rate expected by those who made the projections. This is an important problem which can be taken up for study by students of industrial economics.

Finally, I would like to say that the aggregate amount spent on research and development in India is very small when compared to other countries. India is a developing country and as such the amount spent on research must be considerable, The expenditure on research in India rose from Rs. 27 crores in 1958-59 to Rs. 135 crores in 1969-70. Out of 135 crores, again, the contribution by the private sector was just a meagre sum of Rs. 8 crores. This is because most of the private units which are engaged in research, are industries which have a foreign collaboration and hence they depend on the parent companies for solving their research problems. This is a very big snag. Research has to be based on the conditions available in this country and our dependence on foreign collaborators for studying the problems which our industries are facing may not be conducive to the proper development of our industries. It is here that the institutions and Universities have a very big role to play. By properly orienting research to the requirements of the Indian industries, the scope of research by institutions and universities can be considerably improved.

Thus, we find that in a developing country like India new techniques of production and management will have to be adopted. The adoption of such techniques presupposes an awareness of the existing conditions of the industry for forecasting a perspective for industrial development. Such an awareness for aiming at a proper forecast for the industry's prospects can be rendered effective through research and study, Only institutions and Universities have the time and leisure to take up such activities.

CONSUMERISM IN INDUSTRY

By

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It would be rather naive to say that production is aimed totally at consumption. In fact this unaffected simplicity is a reflection of economic theory in which consumer is attributed a certain sovereign status. Reality is in conflict with this belief in all the countries, at times sharply, due to the compulsive necessity of the respective economic apparatus. This conflict between the consumer and production takes on a sharp relief in a developing society like India where investment in consumer-oriented research is either practically non-existent or where it is done, the feed-back of the findings is not satisfactory.

Consumer and Consumerism :

For the purposes of theory the consumer can be divided into four major groups :

1. Consumer of capital goods
2. Consumer of intermediate goods
3. Consumer of finished goods
4. Consumer of services

Consumerism :

Consumerism in ordinary parlance can be defined as a set of rational attitudes aimed at protecting the interests of the consumer. In which case consumerism can be operationalised to represent the respective interest of the four main groups. While specific interests of the different groups of consumers may vary marginally there is a main core running through the entire system. They are basically, in the order of priority, cost, quality (related

to function) and easy access. In other words, the consumer expects a product to be made available at a reasonable price, of good quality and accessible whenever he wants.

These triple quality of consumerism viz., cost, quality and accessibility is both objective and subjective. In order to measure the forces of these qualities it becomes essential to compile a consumer's profile on a continuous process.

As a first step to promote consumerism in Industry, consumerism *per se* should be studied in an empirical manner. We are living in a period of planning for development with a view to raising the standard of living of the people. To whatextent our planning and economic development have led to differences in the consumption pattern of people living in areas which already have experienced significant degree of development compared with those that are less developed ?

What are the attempts made to study and answer questions of this nature ? Two instances merit attention. In 1965, the Textile Committee appointed an Expert Panel to advise on the role of market research and specific projects to be undertaken which would be of immediate benefit to the Textile Industry. Accordingly " Consumer Preference Surveys " was conducted in Maharashtra (Pilot Study) in Andhra Pradesh, Uttar Pradesh, Rajasthan and Tamil Nadu. The Tamil Nadu study was conducted by the SITRA (South India Textile Research Association) on behalf of the Textiles Committee.

The study attempted to give a picture of the extent of competition between different fibres in adult garments like shirts, pants, saree and blouse among a cross section of respondents. The advantages and disadvantages of different fibres and buying habits, and preferences were analysed by income, education, occupation age and place of residence groupings. Besides, as a step in drawing the consumer profile the Labour Bureau (Ministry of Labour) conducts periodic "Family Living Surveys" among specific occupations. Apart from this and a few other isolated attempts, the Indian Consumer is still an unidentified phenomenon.

The other part of the issue is the attempt to promote consumerism. The Essential Commodities Act, (Laws relating to the essential commodities) essential services, Quality Control and weights and measures give a legal frame work for institutionalising the consumerism in India. Though we may lack a crusading personality like Ralph Wader (Author of "Unsafe at Any Speed") we have created a "Fair Trade Practices Association", supposed to guide the consumer in the right path. But the effectness of such an organisation which was created, financed and directed by the manufacturing community to protect genuine consumer interests remains to be seen.

Cost Reduction as a Tool of Consumerism :

Indian experience has shown that the overall constraints of targets in respect of production, sales and targets, save in exceptional circumstances, leads to a bias for profits as against costs. This is an area requiring critical and searching insight into the production processes in the climate of rising costs.

Any Company to be able to get a clean chit from the rigorous social audit must produce to its maximum installed capacity, quality goods at the most economical costs, distribute these goods as widely as possible. This will be the contribution of an individual firm towards consumerism.

Investment in research (both economic and technical) by industry constitutes barely six per cent of the total investment in research and development in our Company as against the average of 55% in developed country. A step up in this investment is a sine qua non to promote consumerism in India.

PROBLEMS OF RESEARCH NEEDS AND USE OF RESEARCH

By

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No monarch has been able to find his Arcadia and the consumer who is traditionally styled the King in a free society is not free from troubles. For one thing, while he is fairly sure what his want is, he is not at all sure really as to which product will satisfy the want best. Variously styled monopolistic competition or imperfect competition and so on, pulled and pushed by advertisements through the press and the wireless, he is somewhat dazed as to how best he could utilise his chief weapon, namely spending money and apportioning the same between consumption and investment.

It is with this uncertain individual that the production-oriented modern society has to come to terms with. Take a small thing like, say, the tooth paste. What should be the colour of it or rather in what colour or shape or size does the consumer want it? Alternatively, which particular combination will appeal most and what should be the price and how the distribution network is to be to ensure its steady stream of supply? The answer for this is market study and analysis with special emphasis on consumer trends, their pattern of spending and income distribution.

We are now in a society where the traditional values have been replaced by very concrete approaches towards assuring the large masses of our people the greatest possible material wealth and happiness. Today, these resources are very slender indeed and so far as the foreign exchange components go we will never have enough of the same, aided or unaided. One, therefore, has to resort to an optimum utilisation of the resources, supported by sound research into consumer trends and preferences in our Planned Economy. There is no sense in producing things which

the consumer will not pay for even at half the price. Conversely, there is no use in producing things which the consumer does not want and would not pay for because there can be better use for such investment.

Let me take a brief example. I will naturally take an item which is to be seen in every household, from the hut to a villa, namely tumblers. The modern craze for metallic beverage containers is really so heavy that there is quite a considerable diversion of resources in this way when perhaps they could be better utilised in other respects. How far have we succeeded in replacing this by cheap but good glassware or pottery? To give another example, again our consumers do purchase aluminium wires and cables but only because they have to. In the two illustrations given above no approach has been made to evolve a suitable substitute product by improving quality.

The problem, therefore, is a very simple one if one really wants to understand. Our consumers are really starved and are grappling with the basic necessaries of life and it is the ardent desire of all of us to give them a better life. No one, placed in our circumstances, can promise them this. We can, at best, give them suitable substitutes and satisfy their wants to the maximum extent possible by sound market research and a market-oriented production machine.

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SOCIAL SCIENCE RESEARCH AND THE PUBLIC SECTOR

By

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The subject of my paper is "The Problems of Research Needs and Use of Research in Public Sector Organisations". The research contemplated in these papers is social science research and not technological investigations. What I am concerned with is examining the scope of such research, and its utility. In a way my task is made easy since there is very little of such investigations at present. I am saved the labour of collecting and presenting statistical data. On the other hand I am faced with the more arduous task of having to examine the whole question in the mode of a critical philosophy.

A Public Sector Organisation is not just a State enterprise engaged in industrial and economic activities. It is also an important instrument of an ideology conceived by intellectuals in search of a rationalist philosophy of life. This fact is, however, quite often forgotten when the work of individual Public Sector Organisations is under consideration. A whole range of social philosophy has gone into the evolution of the concept of Public Sector Organisations. The aims, ideals and objectives of a Public Sector Organisation are determined by social idealism, and yet when the Organisation has begun to function, the criteria of examination of its success or failure are sought in economic indices. There is, therefore, much confusion in thought and consequently also in the results of the Public Sector working.

The justifications adduced by socialism for the State control of the means of production are said to be mainly two. They are, firstly the inefficiency of economic production in a free market economy, and secondly the inequitable nature of social distribu-

tion in that economy. That is to say, economic productivity and social justice are said to be the aims of socialism. They are based in the first instance on a criticism of free market economy which, it must be conceded, is to some extent true, at least as far as the second objective, namely, social justice is concerned. The validity of the criticism is to be found in the history of free market economy. But it does not follow therefrom that the alternative of State control put forward by the socialists, though apparently logical and rational, would in practice be successful in achieving these objectives. Socialist theory has no doubt a long history of over 150 years, but socialism in practice has been too short-lived to provide sufficient evidence either way.

Even in this short period it has become apparent that socialism has to contend not so much with economic forces, as social. In fact, what is called an economic force is now seen to be, not something in isolation from human psychology—individual and social—but something in which the latter are embedded and which, operating through social institutions manifests itself in various aspects of which economic is but one. The fallacy of thinking that "nature is organised into disciplines in the same way that universities are," – in the words of Russell L. Ackoff - is obvious.

Considering that the National Policy in industrial and social development is oriented towards socialism, the importance of this subject becomes quite apparent. For the State management of the instruments of production lies at the centre of all socialistic concepts, and this calls for a greater and greater involvement of the State. The gradual taking-over of economic activities by Public Sector Units is an inevitable result of the policy. To what extent economic production should come under the control of Public Sector Organisations has been a matter of debate for some time, especially in the post-war years. Socialist thought, till about 30 years back, had more or less accepted the inevitability of complete Statism, but in more recent times a hope began to be entertained of minimising such totalitarianism, and theories have been put forward of establishing what is called a "mixed economy" in which a large area of production activities could be left to the Private Sector. It was post-war India that came forward as the champion of the mixed economy concept amongst the

developing nations. Great hopes were entertained, in the earlier years, of this approach to progress. Thereby it was thought that the evils of totalitarianism would be avoided, and a certain amount of freedom in economic and social affairs would be left to the people. Actually, however, the experience of the recent years has shown that once the State has entered into productive activities directly in a large way, the tendency is for it to take over even those fields which were originally expected to be left to the Private Sector. What we are watching today is the steady expansion of Public Sector activities and a slow shrinking of the field of activity of the Private Sector. The control over the economy is spreading wider with the consequential increase of control over the society. As Gunnar Myrdal has pointed out, in a developing country the two are inseparably interlinked. In fact even the so-called developed societies, such as the United States cannot, without detriment to its progress overlook questions of social value as Prof. Galbraith has shown.

The Public Sector then has begun to dominate the field, and will continue to do so to a greater and greater extent in the coming years. It is useful, therefore, to examine what are the problems of the Public Sector in their developmental endeavours. The objective of National Policy today, as already referred to previously, is the achievement of economic development and social progress. The former term covers such factors as rapid industrialisation, increased productivity, transformation from a rural or semi-rural economy to an industrial economy, and the adoption of sophisticated modern technology etc. The success of this enterprise is dependent to a large extent upon a corresponding change in social institutions which becomes necessary if social harmony is to be retained. It calls for a re-organisation of the social institutions and for re-orientation of educational curricula. It necessitates the acceptance of new mores to suit the economy and the necessary re-patterning of social behaviour. All this inevitably calls for a re-formulation of social values and concepts. However much we may dislike the term, on account of its association with events elsewhere, we must recognise that all this is best expressed by the phrase "cultural revolution". Like the Frenchman in Moliere's comedy "The Misanthrope" who was surprised when he was told that he was speaking prose, it must be something of a

shock to be told that all this adds up to a cultural revolution. Public Administration of which the Public Sector is a part is imperceptibly and unknown to itself engaged in effecting a slow "cultural revolution".

My intention in mentioning this is to lay stress on the bearing that social forces have in the development process and in the functioning of the Public Sector. It is unfortunate that this factor is not at all appreciated in the decision-making circles. Economic development is talked of as if it is purely a matter for economists who with their theories of laws of demand and supply, of money and capital, etc. have merely to draw up blue-prints for attaining affluence which engineers and technicians have merely to implement. So great is the authority of the economists, and so successfully have they established their image in the eyes of the politicians and the general public that they have been admitted into the councils everywhere. That in practice very often their advice has resulted in disasters has never been charged to their account. No attempt is being made to analyse the causes of their failure and to rectify their mistakes. If only this could be done it would become apparent that the cause lies in the overlooking of the sociological factors. Sociology is a recent discipline and has not yet attained sufficient confidence in itself to gain credence from the rulers and the public.

To ascertain broadly the extent to which sociological questions affect the organisation and functioning of a Public Sector Organisation, it would be helpful to consider for a moment how such units come into being and how they actually operate. Whereas the proprietors of a Private Sector Organisation are essentially concerned with the economic criterion of profits in deciding the location, size, and the nature of the unit, the Public Sector unit is set up by people who have no personal involvement or risk in the enterprise, and in whose calculations the element of profit plays little part. The decisive factors are the need to find employment and obtain political loyalty. Such economic questions as size, availability of raw materials and of supporting industries, the extent of the market and the problems of price are subordinate to these main interests. In the operating of these units also economic forces play a more subdued part. Whereas the Private Sector unit

generally has a protected market, the public sector looks to social and political forces to find a viable market for its products. Again whereas the former has to carefully nurture its resources, the latter indulges in lavishness, supported as it is by the State with its vast resources of money and its ability to compel social units to conform to its requirements. In the matter of such social overheads as residential accommodation, hospitals, school facilities, uniforms, etc., the expectation would be that the Public Sector should not stint itself merely on grounds of profitability, and in fact it is so. The size of townships developed by the Railways, the Heavy Engineering Corporation, Durgapur, etc. is an indication of the extent of their involvement in these matters. But contrary to expectations there is a considerable amount of waste and inefficiency. Perhaps this is inevitable in view of the impersonal nature of State ownership. Actually many of the larger Private Sector units are, in these matters, found, in practice, to be more efficient provided they are not altogether devoid of social morals. Arising again from the impersonal nature of State ownership the procedures in management of Public Sector Organisations are highly bureaucratic even when the units are very small. It appears to be an ineradicable condition of socialist working that there shall be a highly centralised inflexible management. The result of all this is seen in the ultimate relationship between employers and employed. We find today the labour situation in Public Sector Organisations to be even less peaceful than in the Private Sector. What is even more amazing is the sight of continued labour unrest in huge Public Sector Organisations which have incurred heavy expenditure on labour amenities, while side by side with them are small Private Sector units operating more smoothly even though the conditions of work in the latter are extremely poor.

The Pubiic Sector suffers from great handicaps in comparison to the Private Sector. It is generally accepted that the latter need not concern itself to any great extent with forces other than economic, the social problems being left to the State. The Public Sector, on the other hand, has to submit itself to the scrutiny of economic criteria and has at the same time to act as a social force by directing its efforts to improving housing conditions, medical facilities, building up roads in undeveloped areas, and going out

to set itself up in backward regions. In addition the freedom which the Private Sector enjoys in its organisation and management decision processes are denied to the Public Sector. The latter is forced to operate within certain set procedures, and to look up to higher authority for important decisions, all of which are both progress-inhibiting and time-consuming factors. What is known as the bureaucratic method is a dominating factor in the Public Sector. The human factors, therefore, play a much more complicated and direct part in the working of Public Sector Organisations.

Here then is a vast field for social science research. To what extent is bureaucratic psychology inevitable in Public Sector Organisations? To what is this attributable? What are the informal organisations functioning in the various units? What is the part played by caste and communal ideals in the functioning of the institutions? With what results? Sociologists of Religion should be able to examine the relationship between religious practices and economic productivity and render advice to managers on how to channel religious forces to improve economic productivity. Why is labour so restive in Public Sector Organisations? Can any improvement be effected in these matters by greater investment in social overheads? To what extent should economic considerations be sacrificed by the Public Sector? Undoubtedly a vast number of projects of detailed investigation in various units will have to be undertaken. The over-all question is concerned with ascertaining whether ideological socialism can be achieved by methods of State capitalism.

It is unfortunate indeed that there is very little interest taken in social research in Public Sector Organisations. To some extent no doubt the fault is that of the managers of these units and of the administrators and politicians who are higher up. But nevertheless, to a large extent, the fault is that of sociologists. Sociology is a subject of recent date. It has been allowed to grow without any sense of direction, and there have been only a very few thinkers who have critically examined its faults. Of those. Wright Mills is one, and he has clearly pointed out how the desire to establish very quickly its authenticity in the eyes of the academic and the public world, has led to much sociological research

becoming trivial. It has made its practitioners believe that a scientific status could be achieved by adopting quantification methods and new jargon. The result is superficiality. By eliminating considerations of value, sociologists have debased the utility of their discipline to society.

Only a new sociology which has successfully abolished the posture of aloofness from moral issues can succeed, even though it may be *at a high cost to itself; in ultimately serving society of* which Public Sector Organisations have come to be a part today. A sociologist must feel himself involved in the affairs of his society and must concern himself with the real forces which operate in the area of his operation. What we require, therefore, of the academic world of sociology is to first of all examine honestly, and without fear, the broad problems of our society. It is only then that the individual field-worker would come forward to examine the details, and collect the data in as scientific a manner as possible which have relevance to the realities of the situation. Only when these have been compiled and presented, and a survey has been made of the situation as a whole can sound theories be *established whose utility will be acceptable to practical men.* Only then will the industrialists, the managers, the financiers and the economists concerned with Public Sector Organisations take an interest in social science research and find a use for it. The sooner it is done the better it will be for both the consumer, that is the Public Sector Organisation, and the producer, that is the social science researcher or the sociologist. Much of the current misunderstanding over the functioning of the former is due to the absence of research on these lines.

PROBLEMS FACED BY R & D ORGANISATIONS IN TRANSFER OF TECHNOLOGY TO INDUSTRY

By

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In our efforts to achieve a higher standard of living, which is synonymous with industrial prosperity in the present day world, the development of science and technology, and its rapid application have a very important and vital role to play. Jawaharlal Nehru, our late Prime Minister, who played such an important role in helping India to build up a strong infra-structure of industrial research, saw science and technology as critically important instruments for solving economic and social problems, and the governments headed by him and the successive Prime Ministers, have based the national planning programmes on the same policy.

It might be of interest to point out that one of the main reasons of industrial prosperity of some of the advanced countries of the world is due to strong and efficient base of R & D system existing in those countries. This close inter-locking of and interdependence between science, technology and industry is a characteristic of the present day world. In recent years, several countries, of which Japan is a classical example, have been able to achieve substantial and rapid growth of their GNP, by a rich and judicious investment in R & D and technical education.

Meaningful industrial research in an organized way had its real beginning in India with the setting up of the CSIR as an autonomous body "for the purpose of fostering industrial development in the country", mainly through the promotion, guidance and co-ordination of scientific and industrial research. Although set up as an autonomous body, the CSIR is financed and managed as a government Institution, governed by the rules and regula-

tions as applicable to any other central government establishment. Almost all industrial research work in India is carried out in the national laboratories established by the CSIR, the share of the industry, as far as R & D activities are concerned, being very insignificant. It was estimated in 1969-70, that out of a total estimated expenditure of Rs. 132 crores on R & D in the country, the share of the private industry was Rs. 5 crores only.

The growth of the CSIR, during the past twenty-nine years of its existence, has been very impressive. It has now more than 30 national laboratories under its direct control, covering a wide variety of disciplines. In addition, the CSIR is aiding more than 10 co-operative research associations for various industries.

Inspite of all the efforts of the CSIR, one of the most distressing aspects of the Indian Science and Technology is the poor impact our R & D activities are making on the industrial output of the country. In fact, it has been estimated recently, that the processes patented by the CSIR laboratories contribute as little as 1/8 of 1 percent to the total industrial output, estimated to be more than Rs. 4,000 crores. This is indeed a matter of serious concern, considering that the annual budget of the CSIR exceeds Rs. 20 crores.

Before making any attempt to assess the real "achievement" in the field of R & D in India, and to find out where the fault lies and how it could be effectively removed, it is essential to appreciate one of the most significant factors of industrial research in the country, which is, that whereas the industry is largely in private hands, the R & D is almost entirely government financed and managed. This, considered with another important factor that the laboratories are managed through a Ministry not directly connected with the Industry, has been one of the major causes, in the opinion of the critics, of the poor impact of our R & D efforts in industry.

In this context, it is also worth considering the amount of money we spend in R & D, in relation to the GNP. In 1969-70, our total expenditure of Rs. 132 crores was only 0.42 per cent of GNP. Industrially advanced countries like Japan, Canada and West Germany (who, unlike U.S.A., U.K., or U.S.S.R., have

negligible R & D expenditures on Defence or Space Research) spend 1.5, 1.0 and 1.4 per cent respectively of their GNP. Judging, therefore, by the meagre amount of sum available for R & D, it is all the more imperative that a proper and effective use be made of our resources, It is interesting to note in this connection that in a conference organised by the UNESCO in 1968, one of the recommendations was to set a target of the R & D expenditure for all developing countries to the level of 1 percent of GNP.

It has already been mentioned that the annual budget of the CSIR is about Rs. 20 crores, with which it has to maintain a large number of establishments, besides providing financial assistance in the form of grants-in-aid to a large number of Universities, Institutions, etc. Considering the diverse nature of disciplines and industries, which the CSIR is supposed to deal with, the resources at its disposal is totally inadequate to meet all the needs of the country, Therefore, it is all the more important that national priorities be allocated, so that our resources could be properly utilised to make significant contributions to industrial development. There is no agency existing in the country for selection of research projects on the basis of their relevance to social and economic needs of the people, and to define the R & D aims in specific terms. In the absence of proper guidance, the selection of problems for investigation in the national laboratories have, therefore, often tended to be haphazard, depending more upon the wisdom and experience of the individual scientists concerned. It is not surprising that such research programmes have not proved attractive to the industry, who have consequently, tended to keep away from the national laboratories, leaving them often to work in isolation.

In spite of repeated assurances given by every prime minister since independence, we still find generalists at the helm of the administration, both in the government departments dealing with various disciplines of science and technology, as well as the public sector industry. There are numerous instances of R & D policies being formulated at the administrative and political level rather than scientific level, and such projects being later abandoned for non-viability. Such incidents have only helped in projecting a poor impression in the mind of the public about the capability of

the national laboratories and the Indian technologists in tackling industrial problems successfully. Similarly, there are instances where a technology successfully developed has not been properly utilised, because of lack of appreciation on the part of the administration, who, being generalists, did not possess the necessary technical knowledge to come to a correct policy decision.

The accounting system of the CSIR follow the form prescribed by the government of India, and for such matters as the conditions of service, Travelling and Daily Allowance, Pay scale etc. the rules frammed by the government apply. Such administrative rules have tended to become more of a hindrance to the scientists in carrying out their work effectively. For instance, under the existing set up, the rules for purchase of equipment, recruitment of staff, etc., are definite hindrances in working to a realistic time target, a factor which is vital to the industry.

The system of costing as used by the government is out of date, and has no relation to modern concepts of cost accounting. Therefore, in most cases it is not possible for a national laboratory to give realistic cost factor to a prospective buyer of a technology.

The scales of pay in national laboratories are in general better than in the Universities, but are not adequate to attract men with experience of industry. Scientists employed in industrial research need frequent visits to industry to keep abreast of the latest trends in technology, and also to have a first hand knowledge of the problems faced by the industry. The existing scale of T. A. and D.A., as applicable to the CSIR, are in most cases inadequate to cover the costs which they incur while on official tour. This has been a major cause of scientists in the national laboratories not being able to maintain a continuous dialogue and personal contacts with prospective users of technology. The importance of personal acquaintance between the transmitter and the receiver in successful transfer of technology cannot be over emphasised.

Let us now examine in some detail the "links" in an innovation chain, which according to Lord Blackett, starts with conceiving of an idea; development of the idea; and then the product and processes based on the idea; exploitation of the product and process know-how ; drawing, design ; sales ; after sales service etc. As may be seen, the industrial research occupies an intermediate

position between pure research on' one hand and industrial production on the other. One of the major obstacles on the way of transfer of technology of a process developed in our laboratories is that there are no facilities readily available for objective evaluation of such processes from a commercial point of view. The industry almost always insists upon " proven " design and technology, without appreciating the fact that an objective evaluation can only be undertaken under actual working conditions prevalent in the industry. For applied research in such areas as mechanical engineering, where development of very expensive machinery and equipment is often involved, it is not possible for national laboratories to bear the capital risk. Nor is it desirable to develop such items without first knowing the particular manufacturing unit or units, who might undertake the commercial manufacture of the product. Lack of R & D facilities in industries, and the lukewarm attitude of industry to research investigations are great handicaps in this respect.

The necessity for the R & D personnel to be uptodate in their knowledge and experience of the modern technology has been mentioned earlier. Only by assimilating the existing know-how, one can improve it. To be uptodate, frequent visits to and contacts with the industry is essential. It has been the experience of many a scientist that request for visits for the explicit purpose of "learning" is not taken very kindly by the industry. The inherent resistance of the industry to share the "know-how" with the scientists, which is based on the fear that it may fall into the hands of its own competitor, can be appreciated to some extent. But this attitude invariably goes against the national interest.

The introduction of a third party, namely the National Research Development Corporation, between the national laboratory and the prospective buyer often gives rise to problems, which stand in the way of a quick and timely transfer of technology. The NRDC acts as the commercial agency for the CSIR products, and the industry have to enter into contractual agreement with the NRDC. This additional link introduces extra time-consuming paper work and sometimes unnecessary delays. Moreover, the CSIR being a government managed institution exclusive licensing of technological processes is not very much

encouraged. Many entrepreneurs have expressed the view that sub-licensing goes against their interests and they are, therefore, not happy to enter into collaboration agreements with the CSIR.

Any transfer of technology involves at least the two most essential parties, namely, the transmitter and the receiver. After having discussed at some length the state of affairs at the transmitting end, let us examine the receiver, i e. the industry, and the condition prevalent there. Why does the industry not utilise the local R & D? Or, is it because the industry does not feel the necessity of indigenous technology.

Our industry has shown an impressive record of progress in the post-independence era, often in the face of great difficulties. But much of our industry is tied up with collaboration agreements with foreign companies, and based on imported know-how and technology. Industries started, under foreign collaboration do not invest in R & D in India, but the technical fees or royalty they pay goes into the research fund of the parent collaborating agency situated abroad. Such companies, therefore, rely heavily on foreign technology and technical experts, without making use of the scientific talent and facilities available within the country. Public sector industries set up with foreign assistance have been equally guilty in this respect, and have shown little interest in the R & D activities of the national laboratories. Those industries which are not so "fortunate" in readily drawing upon foreign technology prefer established or "proven" technology, and as such tend to keep away from indigenous technology which often may involve an element of financial risk.

Import of know-how is done by every country these days. The need for import of know-how for a developing country like ours is all the more essential for rapid development in certain fields. In the absence of any attempt by the industry to have its own R & D wing or a close liaison with a national laboratory, no further development on the imported know-how takes place, for which the industry has to depend upon the foreign collaborating agency for ever, with the consequent drain on foreign exchange. Industry in this country has enjoyed an assured market in many fields for a considerable length of time, and industrial research has not become a compelling necessity from the point of view

of individual entrepreneur, but it is the interest of the nation which has suffered.

Grant of licence for import of technology in a certain field has often been followed up with tariff restrictions to help the growth of the indigenous industry, and protect it against competition from industries in the developed countries. Adoption of this policy for a seller's market like ours has helped the industry to develop a false sense of complacency. Not only the industry in a very large number of fields (particularly in the private sector) has refrained from making any attempt in setting up and conducting their own R & D, but have followed a policy of employing the minimum number of technologists, and that too of the lowest possible level of qualification, just sufficient to maintain the production line going. Individual entrepreneurs have earned handsome profit thereby, but the nation as a whole has not benefited, in the sense that the growth of a sound "technology base" has been retarded. The development of a strong technology base is an absolute necessity, if we want to get rid of our continuing dependence on imported technology. The policy of import of technology as such is not harmful, but such import should not be indiscriminate. The industry should associate indigenous R & D from the inception, thereby enabling our technologists to absorb, improve upon, and even export improved technology.

Absence of a strong technology base within the industry has on occasions offered some difficulty in collaboration with national laboratories, due to the fact that the industry was technically unaware, or could not appreciate work on the frontiers of technology. Many such processes successfully developed indigenously did not have timely commercial exploitation.

Summing up, in a developing economy like ours, the science and technology must be harnessed properly and efficiently. To achieve this it is vitally important to establish closer collaboration and contact between universities, national laboratories and industry. The nation will prosper only when such a rapport is established.

A major obstacle towards achieving this end is the "communication gap" that exists between the various types of institu-

tions and within a particular type of institution itself. Each national laboratory is left to itself to maintain contact with industry, through dissemination of information on current activities, which is often done with insufficient staff and meagre resources. Whatever publicity campaign is undertaken is often totally inadequate to put up a strong case for Indian technology in a situation of very tough competition against foreign technology. A well organised national bureau, with information centres located in different regions is, therefore, a prime necessity. An entrepreneur in search of an information should be able to get it easily and quickly. Similarly, the industry should organise ways and means of passing on relevant information, such as production problems, raw material problems, etc. to the concerned national laboratories. Bridging of the communication gap between various national laboratories and/or Universities will help to reduce a lot of unnecessary duplication of effort in pursuing the same objective. While a certain amount of duplication is sometimes desirable to introduce an element of healthy competition, such duplication should be discouraged as far as possible for the sake of national economy. The industry should provide greater encouragement to its personnel to become members of professional institutions, take more active part in symposia, get-togethers etc., and to keep themselves in touch with the activities of the national laboratories. Another important thing that should be done with some measure of urgency is a technology map of India. Such a map, clearly defining the state of technology in the country, will help considerably in bridging the communication gap, and to identify areas in need of immediate attention.

In shaping the future of science and technology, the leadership in Indian Society has a very important role to play. In spite of a notable growth in the education in science and technology, we continue to be weighed down by tradition and superstition, and the proper "scientific temper" has not yet permeated into the society. We must develop the proper team spirit, a sense of total commitment and involvement in all our endeavours. Finally, but perhaps the most important of it all, we must develop confidence in ourselves and our work.

TAMIL NADU SECTOR OF THE FOURTH FIVE YEAR PLAN 1971-74—PROGRAMME FOR RESEARCH PRIORITIES

By

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PART I

INTRODUCTORY

Research and Development are inter-related. While fundamental research helps evolving new theories and thereby aids progress, applied research helps (1) in formulation of development policies, (2) in determination of priorities (ex-ante), (3) in formulation of projects and (4) in evaluation (ex-post) which in turn helps to alter priorities fixed already. True, policy determination is largely political. But within the broad framework of policy decisions, some priorities are to be observed or to be altered. Thus continuous evaluation is needed in actual working. The sources for such evaluation are primary and secondary. Some require Field surveys and Bench Mark surveys; some are diagnostic in nature; some are case studies; yet others are sample studies or complete census.

Planning and Development require projection work to decide on perspectives—both in public and private sectors. In the private sector when things go wrong very little of economic appraisal is done. An Operational Research study may throw light on the roots of the trouble—sometimes it may be a management problem; sometimes it is in the sphere of labour relations; sometimes it is a marketing problem; But rarely are these studied in any systematic basis in India to-day. In an economy of shortages, the private sector is not compelled to look into such projections or evaluations, for they make profits anyhow. Hence, studies of Demand Forecasts and Marketing problems are often neglected,

In the public sector though project evaluations and cost-benefit studies are made, they are often undertaken in a perfunctory manner for the following reasons :

(a) Political leanings or bias;

(b) administrators are not equipped for the task in view of their preoccupation with day-to-day routine.

Macro and Micro studies are required both for a private entrepreneur and a public enterprise—micro study for understanding the internal problems of a particular unit of production and macro for purpose of obtaining insight into the broad trends of development such as, growth rate, income, employment etc.

In the field of natural or physical resources, research should take the form of techno-economic appraisal of the wealth of the State: land, water, forest, fisheries, animal husbandry etc. The resource position changes from time to time under the impact of development and the extent of the application of science and technology to it. Therefore, periodic techno-economic surveys are necessary, requiring an inter disciplinary approach.

Manpower studies are important to the development of human resources; they are intimately connected with education, training and employment problems.

In the field of fiscal resources, growth rates of various taxes in relation to income groups and changes in the structure of the economy require constant study. The impact and incidence of various taxes on different sectors, their incentive to produce, their effect on consumption and standard of living have to be studied. The new fiscal resources that can be mobilised, the saving potentials, rate of growth of savings and the propensities for savings and incomes of different classes have to be assessed. Research has to be focussed on these matters. In the sphere of Social Welfare, impact of Family Planning, the constraints to its successful implementation, impact of various Social Welfare schemes on the backward classes and tribals have all to be studied. These take the form of socio-economic studies often calling for an inter-disciplinary approach as in the case of techno-economic studies.

The development programmes of the Fourth Plan of Tamil Nadu have to be viewed against this background. Planners who are involved in direct administration and implementation of the schemes will face these problems which would provoke new thinking and whose solution will help further thinking.

Constant dialogue between the departmental heads and research bodies would not only help in finding solutions to problems, but will stimulate new thinking. Each department should have a small cell to study problems and to list them from time to time so that such problems can be entrusted to competent research bodies for detailed investigation. In fact, every Administration Report of the departments concerned should list such problems compulsorily, as that would reflect the thinking that has gone into the various developmental areas in which the respective administrative agencies are involved.

The essential need is for the Government and Captains of industry to realise that applied research is not a luxury but is a profitable proposition—light bearing and fruit bearing at once.

PART II

THE BROAD PICTURE

The Fourth Five Year Plan of Tamil Nadu.

The Fourth Five Year Plan of the State involving an outlay of Rs. 710 crores, nearly double that of the Third Five Year Plan, aims at a rate of growth of 5 to 6 per cent per annum. For the purpose of this paper, the various programmes for development may be grouped under the following broad categories: (1) Agriculture and allied programmes (2) Co-operatives, (3) Community Development, (4) Irrigation, (5) Power (6) Industry and Mining, (7) Transport and Communications, (8) Education, (9) Health and Family Planning, (10) Housing and (11) Welfare of Backward Classes.

Need for an up-to-date Resources Picture.

2. The basic thing in Planning is to get a picture of the resources of the State, human, fiscal, etc. For this, a Techno-

Economic Survey of the State is essential. The Techno-Economic Study conducted by the N. C. A. E. R. in 1958—60 is out of date. A fresh survey needs to be made which would give the latest resources picture at the district, regional and State levels.

Development of Backward Areas.

3. It has been recognised that high priority should be given to development of Backward areas. A Government Study Team has in 1966 identified 31 taluks constituting about two-fifths of the State as chronically drought affected. The districts of Ramanathapuram and Dharmapuri have been declared as backward districts by the Union Planning Commission calling for special planned efforts for development. A techno-economic study leading to a development programme of these backward areas should be separately undertaken.

Industrial Programme for the State :

4. An Industrial Programme for the State is urgent to relieve the growing pressure of population on land. There are many areas in the State which have not felt the impact of industrialisation. The survey of the industrial programme for the State's original Fourth Five Year Plan ending with 1970-71 drawn up by the N.C.A.E.R., New Delhi in 1965 needs revision in view of the lapse of time and the new thinking of Planning with emphasis on employment.

Gaps in the State's Industrial Structure :

5. There are also certain obvious gaps in the industrial system of the State in fields like electronics, plastics, fine chemicals, pharmaceuticals, dyes and dye intermediates, fertilisers etc. Possibilities of developing these have to be explored.

Development of Ancillary Industries :

6. Again, large expectations in regard to setting up of ancillary industries in the Neyveli complex have not been fulfilled: Causes for these have to be examined to avoid similar pitfalls under the proposed Salem Steel Complex,

Feasibility Reports on Industries :

7. In view of the complicated and highly technical nature of the problems connected with the setting up of new industries or expansion of old ones, it is necessary to prepare feasibility reports, project profiles or detailed project reports as the case may be.

Revision of the Fourth Plan for Industries :

8. In the light of these reports, a reappraisal of the various schemes-included in the Fourth Plan is necessary with a view to refixing priorities.

Evaluation reports :

9. Competitiveness is the hall-mark of modern Industrial Progress. The textile industry, the oldest and the most important is in difficulties as its fortunes are linked with the handloom industry. To develop the competitive capacity of the industries, it is necessary to conduct detailed studies of productivity, programmes for cost reduction and a whole range of operational research probes including improvement of managerial efficiency, reduction in wastages, plugging of leakages, saving on raw material, reduction of inventory, utilisation of capacity etc. In a market atmosphere of artificial scarcity created by the licensing system, entrepreneurs in India do not pay adequate attention to studies of demand forecasts and marketing, with the result the country is faced with the recurring phenomenon of under-utilised capacity. Against this broad background, a tentative list of subjects for research studies is given under each group. The list is by no means exhaustive, but only illustrative and as a starting point for discussion.

PART III

LIST OF CANDIDATE RESEARCH PROJECTS

I. Agriculture :

1. *Impact of the Green Revolution on the Small Farmers and Tenant Farmers* ; It has been alleged that the benefits of the green

revolution have spread only to the big and medium land holders. Availability of adequate and timely monetary and other facilities for the small farmer needs to be investigated.

2. *Green Revolution and Agricultural Indebtedness* : A recent study in Andhra Pradesh has revealed that, in spite of the Green Revolution, the indebtedness of the farmers is on the increase due to the high cost of inputs and the extended scope for spending on consumer goods. The position in Tamil Nadu requires to be scientifically assessed.

3. *Economics of Minor Irrigation* : Minor Irrigation accounts for nearly two-thirds of the irrigated area in the State. There is practically little scope for extension of major irrigation. A study of the economics of minor irrigation works, their direct and indirect costs and benefits will be rewarding to the planner. The study will include the improvement of the large number of tanks by way of repairs and desilting. A comprehensive survey leading to a phased tank renovation programme will be necessary. A similar programme for development of well irrigation has also to be worked out.

4. *Economics of Dry Farming* : Economics of Dry Farming cries for urgent attention. A project to investigate the potential area that can come under the new seeds and the quantities of inputs together with an assessment of the costs of adopting soil conversation and contour bunding programme would be necessary on a regional basis.

5. *Economics of Horticulture* :

(a) Grapes cultivation.

(b) Banana cultivation.

(c) Cocoanut cultivation.

6. *Rice cultivation* on the sandy tracts of Trichendur Taluk with cement flooring device.

7. *Tractor cultivation*, its expansion in Thanjavur and Coimbatore districts and its impact on employment and problems it has given rise to, such as tractor servicing.

8. *Scheme for Development of Forest Resources* : Tamil Nadu has limited forest resources, less than a balanced economy should possess. Denudation of forests during World War II and prior to Zamindari abolition has depleted forest resources causing damage to ecological balance, rainfall and seasonal conditions. An appraisal of forest resources and forest policy is urgent.

9. *Development of Animal Husbandry*: Under this broad heading, the following subjects may be considered :

(a) *Economics of Dairying and Milk Supply* ; The Fourth Plan provides for a sum of Rs. 534 lakhs for this purpose. Mixed farming is vital to an economy of small farmers. Dairying can provide full employment to the farmers throughout the year. Adequate milk production will also bridge the nutritional gap in our diet.

(b) *Evaluation of the Working of the Milk Supply Societies:* It is stated that out of as many as 2600 milk supply societies in the State, nearly three-fourths are working on loss.

(c) *Economics of development of cattle, sheep, poultry, and piggery* : The Fourth Plan provides Rs. 496 lakhs for this purpose. It is necessary to identify areas with suitable geophysical conditions and the communities with the maximum development potential. The optimum size of a dairy farm depends on many factors like fodder land available, previous experience, marketing facilities etc. The question of providing improved breeds of cattle, feeds and finance needs detailed study.

10. *Development of Fisheries* : The Fourth Plan has provided Rs. 10 crores under this head. The economic condition of fishermen together with the equipment and technical facilities available for catching, storing and internal marketing and export of fish constitute an important area for study with regional approach. The potentialities of the extensive eastern sea board and the numerous irrigation tanks and reservoirs have to be explored and measures for their further exploitation devised.

11. *Warehousing and Marketing* : Under this sub-head, outlay in the Fourth Plan will be of the order of Rs. 80 lakhs. A study of the marketable surplus of the major crops in each district

vis-a-vis its x storage capacity will involve an inter-disciplinary approach involving the departments of Co-operation and Agriculture and the team work of agricultural scientists, construction engineers, economists and cost accountants.

12. *Economics of Bhoodan land distribution:* An appraisal of this problem is likely to lead to better land utilisation.

13. *Impact of the Land Ceiling Act of 1961:* A study of distribution, cultivation and productivity of surplus land thrown up by the Act will throw up valuable guidelines for refinement of land reform measures.

II. Co-operation.

14. *Economics of Co-operative Marketing Societies:* The Santhanam Committee on Co-operation has indicated some of the problems requiring detailed investigation and research. Co-operation has a big role to play in the country's socialistic development. Towards strengthening of the existing 133 Co-operative Marketing Societies, a sum of Rs. 135 lakhs is provided in the Fourth Plan. A research probe into the economics of Co-operative Marketing Societies would indicate the lines for their future development.

15. *Consumer Co-operatives:* With the relaxation of controls, the societies have to face keen competition from private traders. Their working requires a detailed study. Most of the Super Markets which were launched in the last few years are working at a loss. The causes for their failure financially require close examination.

16. *Co-operative Finance:* The requirements of total finance for (a) Agriculture (b) Small Scale Industries, and (c) Export Industries required to be assessed scientifically in advance.

17. *Land Development Banks:* The old Land Mortgage Banks have given place to the Land Development Banks. This is a change not only in name, but also in spirit, objectives and approach. A sample survey of their working and achievements will be of help in policy making.

18. *Mobilisation of Rural Savings:* The role of Co-operative rural banks in this sphere requires to be studied on scientific lines.

19. *Economies of Modern Rice Mills:* There are more than 12 modern rice mills, each set up with a capital outlay of Rs. 10 lakhs. The Fourth Plan provides for more than Rs. 120 lakhs for expansion and modernisation of the existing rice mills. Doubts have been expressed about the economics of modern rice mills. Only a detailed study will establish the factual position.

20. *Community Development:* The Community Development has not yielded the results expected of it. The causes for the set-back may throw light on the directions in which future rural reconstruction programmes should move and the nature of planning that should be done at decentralised levels.

21. *Handloom Industry:* Handloom industry is the most important cottage industry in the State. It is steadily being brought under the Co-operative fold, which accounts for 43 per cent of the total looms but only 24 per cent of the cloth production. A provision of Rs. 30 lakhs is made for share capital assistance to new entrants to the co-operative sector. An appraisal of the position of the handloom industry and its prospects for the near future with particular reference to the units in the co-operative sector vis-a-vis those in the private sector would be of help in policy making.

22. *Power Looms Industry:* The Fourth Plan makes a provision of Rs. 216 lakhs for the installation of Power looms pending an expert study on its implications. This expert study throwing light on the economic effects of the introduction of power looms, short term and long term, with particular reference to wages, employment, productivity, and finance may well be commenced.

III. Industry

23. *Industrial Estates:* The Fourth Plan provides about Rs. 5 crores for development of industrial estates and Rs. 4 crores for developed Plot Estates. A detailed study of their working will show (1) how far the existing facilities have been utilised (2) to what extent they have led to dispersal of industries and (3) whether the small industries set up in them have served as growth points.

24. *Export Promotion:* The Fourth Plan envisages the establishment of an Engineering Export Corporation for which a provision of Rs. one crore has been made. The Indian Institute of Foreign Trade and the Trade Development Authority constituted recently are helping Indian exporters in exploration of foreign markets. Even so, there is vast scope for research in the identification of items for export, as West Europe, United States of America and Japan are gradually vacating the areas of labour intensive goods. This is an opportune moment for India to step into the breach. The possiblities of Tamil Nadu's contribution are worth investigating.

25. *Components Manufacturing:* The automobile, cycle and radio industries provide ample scope for a study of the vertical linkages that exist so as to identify growth points and stimulate them.

26. *Regional Studies:* Resources like water, forests, minerals etc., are often of an inter-district character. District Plans will have to be made in the light of these regional resources. This calls for regional studies.

27. *Tuticorin Complex:* A sizeable industrial complex is being planned at Tuticorin. A bench mark survey of the socio-economic conditions of Tuticorin and its belt area will help measure not only the impact of the development, but also the growth problems it throws up.

28. *Salem-Neyveli Complex:* A similar study is called for in the Salem–Neyveli region. It will help in identifying the future lines of profitable development and location of new industries.

29. *Cottage Industries:* For the promotion of handicrafts, there is a provision of Rs. 136 lakhs in the Fourth Plan. A study of nine selected cottage industries was made as early as 1954 in the composite Madras State. A survey of the more important cottage industries will throw light on how best their productive efficiency can be improved and their marketing possibilities widened.

IV. Power:

30. *Electricity Undertakings by Licencees:* Local authorities and private companies are today distributing power under

licence from Government. There are differences in their power rating and distributive efficiency. These require an examination.

31. *Economy in Rural Power Transmission and Distribution :* The Tamil Nadu Electricity Board has built a vast net work of generation and distribution and as this net work reaches to the remotest villages in the State in a scheme of comprehensive rural electrification, loss of power in transmission becomes heavy and serious. It is estimated that even a one per cent saving in tran-mission loss can add several lakhs of rupees to the revenues of the Board. A techno-economic study of this problem involving an inter-disciplinary approach will throw up valuable guidelines for action.

Other studies that suggest themselves in this area are listed below (32 to 35).

32. Inventory and Stores control in the Power Industry.
33. Construction of a material cost index for the use of the Electricity Board.
34. Additional productivity due to lift irrigation by electricity.
35. Problems of costing in the Power Industry.

V. Transport and Communication :

36. Competition between Road and Rail Transport in selected sectors will reveal the need for realignment of routes and improvements in State Transport system.

37. *Optimum size of road transport :* The State Transport is serving an increasingly large area year after year. But there is a point at which such expansion may result in diminishing returns. At what points and under what conditions this will happen require worth studying ahead of events happening.

38. *Taxation of road transport :* Incidence of this taxation on passenger and goods traffic, the inter-State problems it gives rise to etc., require to be studied on a comparative basis in relation to other States.

VI. Education :

39. Wastage of education at various levels–social cost.
40. Rural education and job orientation.
41. Survey of the utilisation of library centres.
42. Development of Basic education-An Assessment.

VII. Health and Family Planning :

43. *Evaluation of Family Planning Measures* : The Fourth Plan has made a provision of about Rs. 29 crores for Family Planning. It is necessary to make an evaluation of the various Family Planning measures. The reluctance of medical personnel to serve in rural areas and the types of incentives required have to be examined. Implications of the various suggestions, such as raising the age of marriage, withdrawal of maternity benefits, additional monetary or other concessions required for those who limit their family size, have to be examined from all aspects. This is a field calling for a number of research studies to enable money being spent well.

VIII. Housing :

44. A projection of Housing requirements—rural and urban in 1980.

45. *Urban Housing Shortage* : The Fourth Plan provides for Rs. 30.30 crores for housing. Outlay on housing was pruned rather drastically in the three previous Plans. Special efforts have to be made to make up for the backlog. The Slum Clearance is an important aspect of the work for which a provision of Rs. 8 crores is made. The impact of Rent Control Act on Urban Housing may also be looked into.

46. Manpower requirements for the Housing Programme—skilled, semi-skilled and unskilled.

IX. Employment :

47. *Agricultural labour–wage trends* : Wages lagged behind prices. This has to be clearly studied for different agricultural areas and for different seasons.

48. Increased employment opportunities of agricultural labour within the agricultural sector with special reference to Green Revolution.

49. Unemployment situation in the State—educated and uneducated. The Plan is not employment oriented. There is a large backlog of unemployed—both educated and uneducated. An assessment of the extent of unemployed and reframing the Plan with employment orientation have also to be done.

50. Assessment of Technical unemployment.

51. Impact of Land Reforms on Agricultural Employment.

52. Rural-urban migration.

X. **Welfare of Backward Classes**:

53. *Impact of the Welfare Programmes on Backward Classes: Harijans and Scheduled Tribes*: The Fourth Plan makes a provision of Rs. 10 crores for the welfare of backward classes. The Sattanathan Committee has recently gone into their condition. A detailed study of the impact of the welfare programmes on the Backward Classes is necessary.

XI. **Local Bodies**:

54. *Corporation and Municipal Finance and Fiscal Policy*: A study of the powers and limits of taxation of these bodies and the ways and means of augmenting their resources will be of public value.

55. Studies of traffic problems, urban planning, slum clearance etc., in Municipal areas will be of public value.

56. Survey of Panchayats and Panchayat Union finances.

THE RURAL ECONOMY OF INDIA: PROBLEMS FOR RESEARCH

By

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Seventy per cent of the people of India live in villages and agriculture accounts for more than 50% of the country's national product. Obviously in the context of planned economic development of the country the question arises whether agriculture is given the attention which it deserves and whether the agricultural sector is made to contribute to national productive effort to the extent it can or may be expected to contribute.

(1) Mobilisation of rural savings :

There are two aspects of this problem both of which have to be examined in detail but about both of these our knowledge is meagre. One is the financial aspect. The inter-dependence between the agricultural sector and the industrial sector is too well known to require any special mention. In the interests of balanced development equal attention is to be given to the two sectors. The savings of our economy may be a little more than 10% of the national income. Since half the total national product is generated in the primary sector one would like to know what proportion of this agricultural income is saved and invested. In particular we have to check and find out whether there is any truth in the assumption that the gap between actual savings and potential savings is far wider in the agricultural sector than in the non-agricultural sector. Some of the prevalent views are that the agricultural sector is relatively undertaxed, that our financial institutions have not been successful in mobilising rural savings, that a substantial part of rural incomes is dissipated or at any rate has not been made available for investment purposes and that our aggregate investment rate will go up appreciably if the sources of agricultural incomes are properly tapped.

Some of the view points mentioned above may be only of an intuitive nature. But these hypotheses need to be tested and verified. And if they are correct we have to devise ways and means for the better utilisation of the financial resources available in the rural areas. Obviously this opens out a vast area for research and study.

(2) Need for estimating the wastage of human resources :

Another disturbing feature of our rural economy is the huge wastage or underutilisation of human resources. We are conscious of the gravity of this problem, but the magnitude of the problem of rural unemployment has to be correctly ascertained and its effect on the growth of the economy has to be analysed in detail. The number of people not contributing to production in the rural areas is bound to be very high if the under-employed and disguisedly unemployed are also taken into account. But the available statistical data relating to these are quite meagre and unsatisfactory. Estimates of the disguisedly unemployed range from 10 to 30% of the labour force in the villages. The proportion varies from region to region but we have to find out the real nature and magnitude of the problem and its seasonal and regional variations. This information is very much needed if we are to plan the utilisation of the human resources in the best manner possible.

(3) Why enthusiasm for national economic development has not been awakened ?

Equally important as the quantitative aspect of the population problem is its qualitative aspect. Labour plays the key role in economic development and of late, economists and sociologists have laid considerable emphasis on the need for a social awakening among the masses in under-developed countries. We have had planned development in our country for the last 20 years but have our achievements in this line aroused the masses into action ? If the large number of people in the villages are still lethargic and superstition ridden, and otherworldly, how would we account for it ?

Perhaps one reason is that our efforts at creating a keen urge on the part of the people for economic development have been wrongly conceived and in a way wrongly directed. Consider for instance the National Extension Service and the Community Development Projects. These programmes have given the villagers new helpers — the village level worker, the Extension Officers, the Social Education Officer and the Block Development Officer—and above them a series of grades of Officers in the States and at the Centre with a Minister at the top. Multiplying the government staff in this manner would not lead to a rise in agricultural production unless there is an adequate response from the people for whom the schemes are intended; and that response would not be forthcoming unless the government agents working among them have the zeal, the enthusiasm, the drive and the understanding of men and things. Such a spirit unfortunately is quite often lacking and the Officers especially in the lower grades, plod on in the routine way as insignificant parts of a complicated machinery. The fact is that measures of socio-economic improvements like co-operation and Community Development Projects are conceived from above and imposed on those below.

In reality, the enthusiasm of the people can be aroused not so much by flaunting the ideals of social justice and equality as by concrete achievements in that direction. A new strain of paddy or sugarcane or a new method of planting or irrigation when proved to be successful, would create a real interest in agricultural effort much more than what publicity about ideals and targets can do. The fact is that our achievements have fallen far short of our ideals. Statements have been made over and over again in public documents about reducing disparities in income and wealth through taxation, control of monopolies, fixation of land ceilings and minimum wages, better treatment of labour, granting of subsidies etc. However, inflation and rise in capital values have only accentuated inequalities. Thanks to a steady rise in prices, the lower middle classes have now lower real incomes and the industrial workers have barely maintained the pre-war level of real wages. Growing influences of industrial magnates in national economic decisions, increasing corruption in public life and the discount at which social values are held make one feel that there is less economic democracy today than there was twenty

years ago. It is therefore not surprising that popular enthusiasm for national economic effort has not been awakened.

These views again may be considered as only a matter of opinion and may be controverted. If so, there is only greater justification and need for an intensive and dispassionate study which would throw light on the true nature of the problems, bring out the basic factors underlying them, expose the defects in the conception and implementation of our socio-economic policies and suggest ways of rectifying the effects.

(4) Locating Urban Growth Centres:

Another fruitful area of research may be found in the socio-economic relationship between urban centres and villages. Many of the contemporary under-developed countries have a dualistic economy i.e., an economy consisting of a few regions which have attained a high degree of economic and social advancement and vast areas of total backwardness. The former are mostly the urban centres and the latter, the rural areas. Those areas in a country which are industrialized and urbanised become the spear-heads of economic advancement. The development of urban centres gives a fillip to agricultural expansion in the surrounding regions by raising the cost of labour and thereby indirectly raising its productivity; by making available financial and capital resources and also by providing an expanding market for the products of the rural areas and thus creating an incentive on the part of the farmers to produce more. These urban areas may well be the growth centres sparking off growth forces which would react on the villages in the periphery and thereby contribute to the overall expansion of the economy. A pattern of development based on this thesis would logically involve diversification of industries in economically backward countries.

Such a strategy of development appears ideally suited to a vast country like ours. At present only about one fifth of India's population lives in cities and towns. Many of the industries including a large number of small industrial establishments have grown in and around the cities and towns. Thus in 1968 in Delhi there were about 19,000 small scale industrial units i. e., nearly 16% of the small scale units in the whole country. In Tamil Nadu,

the small scale units in Madras alone accounted for about 25% of the total number of units in the entire state. The major metropolitan cities have been the most important marketing and distribution centres as well as industrial growth points in the country.

Thus the idea suggests itself that if industries as diversified and located in village centres which have the necessary growth potential, these areas would develop into urban centres and facilitate the economic transformation of the regions around them. This method has been tried with success in recent years in Israel, Japan and Puerto Rico. Initially the industries chosen in the village centres may be of the agro based type but they would rapidly prepare the way for heavier and capital intensive types.

In India a suggestion to develop the economy along these lines was put forward by the Karve Committee in 1955. It stressed the need for evolving a pattern of industrialisation of groups of villages with an industrial urban centre as the nucleus of each group. The proposal was implemented in a way by the starting of industrial estates in the country. But industrial estates have not been much of a success from this point of view. And this, for two reasons—in the first place, the industrial estates are located mostly in or very near cities and towns. Of the 303 completed and functioning industrial estates in the country in 1970, about 78% were located in urban or semi-urban areas and only 22% in rural areas. Secondly, industrial estates have turned out to be highly capital intensive and have provided only limited employment opportunities.

Nevertheless, the soundness of the idea behind the establishment of industrial centres in rural areas cannot be disputed. What is required is a careful examination of the means by which the scheme can be implemented successfully. We have to plan a net work of intermediate towns where the various developmental measures may be suitably interrelated so as to foster rapid and integrated economic growth.

The first and major task is obviously to identify the growth centres. This however is possible only if adequate statistical data and information are available in respect of particular regions. We have to get a correct picture of the availability of natural

resources and manpower; the accessibility of the area—whether it is connected by roads and railways with important towns; whether the industries which can be started in a particular region will have satisfactory forward and backward linkage effects; nearness or otherwise of ports and harbours; availability of adequate financial resources, export possibilities of the product; whether entrepreneurship will be forthcoming, and so on. A considerable amount of investigation and research work will be needed if adequate information on the points mentioned above is to be obtained.

And this research has to be of a continuing nature, for, when once the centres are chosen and work commenced on the building up of industries, fresh problems are bound to arise necessitating further investigation and inquiry. For instance basic amenities are to be provided in the area such as water supply, sewer and sanitation facilities, financial, educational and public health facilities. Also provision has to be made for the storing of materials and finished products and for marketing of the finished products. Adequate fuel and power supply is to be assured. As development proceeds, these requirements would be increasing but in satisfying them care should be taken to see that they fit in with the overall pattern of development. Hence a continuing investigation of their financial implications and a study of the effect of such investments on regional development as well as on the expansion of the economy become necessary.

CONSUMER/USER ORIENTED RESEARCH IN AGRICULTURE

By

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Agricultural research has been successful in evolving the newly introduced exotic crop varieties known as 'Miracles'! They showed the farmers the way out of the stagnation in agricultural production. They roused the farmers from the torpor of traditionalism and involved them in modern farming. Farmers who are hesitating whether they could use these strains soon began to think of how they could use them and ended by successfully utilising them, achieving production levels they would never have dreamt of. But the consumer was dissatisfied as he did not relish some of the new varieties which when cooked become glutinous as Taichung Native I. Hence there was no off-take with resultant accumulation of surpluses and crash in prices.

Food processing avoids physical wastage of commodities, simplifies transportation and spreads the period of consumption. An expanded food processing industry with its requirements for assured supplies and standards of quality could help provide more stable markets for the new commercial farmers. Alternatives to refrigeration as a method of food preservation should be explored more fully to meet the different climates and levels of overall development in our low income country. The worldwide distribution and sale of cola drinks suggests the potential for modern food processing technology and mass distribution systems.

Knowledge about human nutrition diet deficiencies and food chemistry has grown in recent years. Protein deficiency is particularly marked in our country. Ideally, adequate protein is obtained from animal products, but there are other ways of increasing the protein content of human diets. Cereal geneticists

can create higher cereal protein content by breeding new varieties of grains with a better amino acid balance. Secondly grains can be fortified directly with synthetic amino acids or by adding small amounts of soya flour or peanut flour without altering the flavour or colour of the flour made. Third, special protein—rich foods—drinks can be manufactured by including peanuts, cotton seeds, coconut or soyabeans as a part of the composition. In the United States many people have these composite food products in their regular diets now. If some of the flavoured beverages widely sold in India could be protein-enriched the difference in diets could be significant.

Besides an outlet has to be found for the surplus resulting from the green revolution. Thus seasonal vegetables and fruits which cause a glut in the market, pectin and papain from papaya, garlic powder in tablet form with better keeping qualities, mango flakes, banana powder etc. are instances in point. Cotton·seed crushing could save Rs. 25 crores of edible oil imports. Similarly rice bran can be deoiled. Research is being carried on at the Central Food Technological Research Institute, Mysore, to evolve new uses for such excess products.

In traditional agricultural systems, farmers buy no manufactured inputs and produce little for urban markets. Cultivators using modern technology make economic ties to a wide array of agribusinesses—manufacture of agricultural equipments and chemicals, storage and warehousing operations, processing firms and distributing organisations. Research is necessary to help the producer in his role as a consumer of inputs by evolving the right type of fertilisers, machines, seeds and pesticides.

Once a bench mark map has been made periodic resurveys will reveal changes taking place in the marketing system. It is an important step in research to select a location for a new wholesale centre or a large retailing establishment like a super-market. The geographic distribution pattern in a city is apt to be confused. Consumers in a neighbourhood do not all buy all their supply of a commodity from the nearest retail shop. Some prefer to go to a control market, some find it convenient to buy at shops on their way home from work etc. Some retailers may prefer to

buy not from wholesale centre nearest them, but in some other place. There may be itinerant farmers or peddlers who sell directly to housewives or to small retailers. But the attempt to delineate main geographic, trading patterns in a city can be useful in getting to understand how the marketing there is carried on and the structure of competition. It may help in identifying inefficiencies and thus help the consumer with a cheaper end-product.

Supply and demand analysis is essential for forecasting the market 'outlook' so as to anticipate future needs of the marketing system and possible bottlenecks. It involves a different kind of research in that supply has its roots in agricultural production economics, demand in consumer behaviour e g. coconut oil in Kerala has a derived demand based on the demand of consumers for the final products. In the past expanding demand has been dependent on three factors :

(1) increasing population in Kerala at 2.7% per annum,
(2) increasing real income,
(3) new uses.

The demand for coconut oil in Kerala under current price conditions is highly price inelastic at 0.2. The income elasticity is 0.6 indicating that per capita demand for coconut oil is responsive to income changes.

What does all these mean to the coconut industry in India? They mean that coconut oil consumers would take relatively little more coconut oil even if prices were to decline very substantially. Specifically, the elasticity co-efficient indicates that with a 10% decline in prices, Indian consumers would wish to purchase only 2% more soap and confectionaries, other things being equal. Conversely, it specifically means that should coconut oil prices rise by 10% in India consumers would wish to reduce the consumption of soap and confectionaries by only 2%. Creating a scarcity of coconut oil in India would, therefore, increase total revenue to the coconut industry in the short-run, but this policy might encourage substitutes move into the soap and confectionary industries. It should be remembered that coconut oil prices are already high relative to some of the other oils.

Secondly, the income elasticity of 0.6 means that Indian consumers will use more soap and more confectionaries as their real incomes rise. Specifically, it means that a 10% rise in real income will be accompanied by a 6% increase in the use of soap and consumption of confectionaries, other things being equal. The coconut industries should, therefore, wish that the real incomes of Indian familes using coconut oil would increase, because it would mean that these families would be using more coconut oil in its various uses.

It is desirable to emphasize that we live in a highly technological age, where research and development can drastically alter the characteristics of given products increasing their substitutability. The wider the spread between the prices of coconut oil and substitute oils, the greater is the danger of substitutes being developed. The Indian Coconut industry quite naturally wishes to obtain the highest possible price for its products. In the long run, however, increasing the price differential could reduce the total demand for coconut oil in India and probably in other markets of the world as well. Hence research should be directed to evolve correct price policies which will expand the market and result in increased net income to industry and greater satisfaction to the consumers.

Hence research has to be constantly oriented to help the producers in their capacity as consumers and also of consumers—urban as well as rural.

PROJECTS OF SOCIO-ECONOMIC IMPORTANCE ARISING FROM THE INTRODUCTION OF IMPROVED AGRICULTURAL TECHNOLOGY

1. Agricultural Labour and the Green Revolution :

The fortunes of agricultural labour in the changed circumstances of scientific agriculture have been much discussed recently. But there is a great lacunae in the data on this subject. Recently a paper appeared in the 'Economic and Political Weekly' of Bombay dealing with this question, wherein the author has contended that with the possible exception of Kerala Agricultural Labour has

either suffered in real terms or maintained the status quo in other States. The author admits that there is not much data on which his conclusions are based the only ones being the Agricultural Labour Enquiry Committee Reports which are out of date and the rounds of the N. S. S. Hence there is an urgent need to study the employment pattern of hired labour in agriculture, conditions of work, wages and perquisites and number of days employed, displacement of labour, migration of labour, off-farm employment etc.

2. Socio-Economic Tensions due to Green Revolution :

The Green Revolution has been described as a cornucopia or a Pandora's box. Francine Frankel of the U.S. AID has pointed out from her studies in the Thanjavur District that the rich land owners alone have the resources to invest in the sophisticated technological inputs and bear the necessary risks. Hence the rich alone get the benefit from the improved technology leading to the phenomenon of the rich getting richer and the poor getting poorer. It has to be ascertained from field studies to what extent this is true. This has been commented on also by Dr. Wolf Ladjinsky the internationally known Land reform expert in a series of articles in the Economic and Political Weekly, Bombay.

3. Small Farmers Development Agencies :

These have been opened in one or two districts in each State in India to help potentially viable farmers to become viable. Many feel that the amount allotted and the numbers benefited will only touch the fringe of the problem. Studies are necessary to assess and and evaluate the effect of these agencies.

4. Tenancy and Land Reforms :

It has been frequently said that the biggest constraint to the green revolution lies in the antiquated tenurial pattern and the archaic laws governing land-tenant relationship. Ceiling laws have remained more honoured in the breach than in the observance. Hence studies have to be conducted to ascertain how far ceiling laws have been implemented, how many have benefited, to what extent and what measures are necessary to give incentive to tenants to participate in the green revolution.

5. Storage :

Storage and marketing problems are called the second generation problems of the green revolution. Unless steps are taken betimes there is a danger that the high yields of the green revolution may not find adequate storage accommodation. Where the ware-houses and godowns should be located, the respective roles of the Central and State ware-housing corporations, transport needs, number of wagons required have all to be spelt out in detail. To what extent ware-houses are being used by actual cultivators & the idle capacity which remains unutilised etc., are all problems requiring study.

6. Marketing :

Marketing is a neglected subject. Unless cultivators get a greater proportion of the consumer's rupee, producers may not find the incentive to take to the new technology enthusiastically. This is a vast subject of study since many crops and many types of markets are involved. But little work has been done on the marketing aspect of the High Yield Technology. Such studies should be taken up on a priority basis.

7. Price Stabilisation :

Unless the cultivator gets a proper price for his produce he may lose all interest in the improved technology. Instances are known where the price of a high yielding variety of rice has fallen below that of Samai or Thenai. The cultivator's dismay can well be imagined. Hence price stabilization schemes require data on cost of cultivation of crops with attention to methodological issues.

8. Economics of dry Farming :

9. Other Schemes :

(i) Comparative studies of communities in changing traditional society.

(ii) Green revolution and its effects on economic structure.

(iii) Econometric projections for India.

(iv) A study concerning the evolution of development projects for India.

(v) A study of Agricultural co-operation in India.

(vi) A study of new trends in food production in India.

(vii) A study of development administration in India.

(viii) A study of development of human resources.

(ix) Statistical survey of the International comparison of National products in real terms.

(x) A study of the Investment climate in India.

(xi) A survey of the Taxation system in India.

(xii) A study of the inflow of foreign private capital and economic development in India.

(xiii) Is agriculture in India taxed properly or let off lightly? If the latter is the case, remedial measures to correct the imbalance between Urban and Rural areas.

(xiv) The terms of trade between agriculture and industry during the past four plans.

AREAS OF RESEARCH RELATING TO AGRICULTURAL DEVELOPMENT IN TAMIL NADU

By

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A. Production

1. Input-output relationship in farming with reference to different regions, crops and scales of operations.
2. Cost-benefit analysis of different varieties of high-yielding seeds.
3. Economics of adoption of improved agricultural practices.
4. Factors influencing adoption of modern technology in agriculture.
5. Scope and effect of mechanisation in agriculture for various classes of farmers.
6. Economics of dry farming in different regions.
7. Economics of alternative sources of irrigation.
8. Economics of different methods of water management.
9. Impact of irrigation on cropping pattern, land utilisation and investment in agriculture.
10. Utilisation of irrigation potential.
11. Impact of green revolution on distribution of income in rural communities.
12. Resource use and productivity on farms in intensive and non-intensive agricultural areas.
13. Economics of mixed farming.
14. Economics of animal husbandry enterprises (livestock, dairying, poultry, etc.) with special reference to scale,

15. Role of co-operatives in developing animal husbandry enterprises.

B. Prices

1. Relationship of prices of agricultural products to the cost of their production.
2. Analysis of variation and behaviour of prices or agricultural commodities.
3. Establishment of norms for fixing remunerative prices for agricultural products.
4. Long-term projections of supply and demand.
5. Influence of price variations on cropping pattern.
6. Effect of co-operatives on the price-making process.

C. Supply, Processing and Marketing.

1. Economics of different methods of procurement of agricultural inputs: seeds, fertilizers, pesticides, etc.,
2. Study of timely availability of required inputs to farmers with reference to regions, crops and scales of operations.
3. Benefits of co-operative supply of inputs.
4. Study of price spread between price paid by consumers and price received by producers in respect of various agricultural commodities under different maket situations.
5. Economics and efficiency of alternative techniques of processing of important agricultural products.
6. Economics and efficiency of alternative methods of storage of various agricultural products:
7. Analysis of cost of marketing in relation to different methods marketing.
8. Economics of different methods of procurement of food-grains.
9. Impact of procurement levy on marketing of agricultural produces.

10. Impact of regulated markets on marketing of agricultural produces.
11. Study of operational efficiency of processing co-operatives.
12. Study of operational efficiency of marketing co-operatives.
13. Establishment of norms of viability for different processing and marketing co-operative units.
14. Role of co-operatives in improving the marketing of agricultural products.
15. Terms of trade of agricultural outputs vis-a-vis terms of trade of agricultural inputs.

D. **Agricultural Finance.**

1. Savings and capital formation in agriculture.
2. Supply of production and marketing credit in relation to the requirements of various classes of farmers.
3. Factors affecting securing and repayment of credit by small farmers.
4. Factors affecting securing of credit by tenants.
5. Utilisation of production credit by various classes of farmers.
6. Study of the working of co-operative crop loan system.
7. Analysis of factors affecting cost of credit procured from different credit agencies (money lenders, credit cooperatives, commercial banks and Government):
8. Extent of financing of farmers by commercial banks.
9. Cost of financing of agriculture by commercial banks vis-a-vis cost of financing of agriculture by cooperative banks.
10. Establishment of viability for agricultural credit co-operatives and primary land development banks.
11. Study of loan procedure adopted by different institutional credit agencies like co-operative credit societies, land development banks and commercial banks.

12. Study of viability and operational efficiency of block-level land development banks.

13. Study of economics of branch-banking in co-operative central banks.

14. The impact of branch-banking on the mobilisation of deposits and on credit services of central co-operative banks.

15. The operational efficiency of central co-operative banks.

16. Study of the problem of overdues in agricultural credit co-operatives.

17. Study of utilisation of agricultural credit.

18. Impact of entry of commercial banks in the field of agriculture on the working of co-operative banks.

19. Survey of pattern of credit requirements for agricultural production, supply processing and marketing in different regions and establishment of lines of coordination between different financing agencies.

20. Study of issue of rural debentures by the central land development bank.

21. Difficulties faced by the central land development bank in securing full subscriptions to debentures floated by it

22. The pattern of inter-investment in the co-operative movement in relation to resource mobilisation.

23. Relation between agricultural credit co-operatives and marketing and/or processing co-operatives and linking of credit with marketing and/or processing.

24. Coordination between short-term credit structure and long-term credit structure.

E. Land Reforms

1. Impact of land reform measures on — (1) Production, (2) land distribution, (3) absentee land-lordism, and (4) tenant cultivation system.

F. Agricultural Taxation

1. Economics of irrigation rates with reference to cropping pattern and scales of operations.
2. Operation of agricultural income-tax system.
3. Incidence of electricity rate on agriculture in different regions.
4. Incidence of land revenue on different classes of farmers.

G. Labour and Employment.

1. Impact of modernisation of agriculture on rural employment.
2. Impact of mechanisation of agriculture on rural employment.
3. Employment potential of agricultural programmes like irrigation, soil conservation, land reclamation, etc.
4. Agro-industrial integration and rural employment.
5. Productivity of labour under different methods of cultivation.
6. Factors influencing conditions of agricultural labourers.
7. Impact of industrialisation on agricultural labour market.
8. Mobility of labour from agricultural to non-agricultural occupations.
9. Study of Agrarian Tension in fertile tracts like Thanjavur.

H. Agricultural Development.

1. Factors influencing rate of growth of agricultural development.
2. Role of rural institutions (panchayats, cooperatives, extension agencies) in stimulating agricultural development.
3. Evaluation of agricultural development programmes like HYV programme, IAAP, etc.
4. Cultivators' responses to different media of communications used by extension workers.
5. Effectiveness of different media of communication in spreading innovations among cultivators.

6. Evaluation of working of Small Farmers' Development Agency.
7. Impact of rural employment and relief programmes on agricultural development.
8. Feasibility studies for establishing Irrigation Cooperatives and Electricity Cooperatives.
9. Feasibility studies for establishing cooperative farming societies in appropriate places.
10. Feasibility studies for establishing agro-based industries.
11. Feasibility studies for establishing customs service units in rural area either as independent co-operative units or as adjuncts to agricultural credit or marketing co-operatives.
12. Establishing norms for operationalising the concepts like 'small farmer' and 'marginal cultivator'
13. The social effects of membership and participation in agricultural co-operatives on the community.
14. Impact of monetary and non-monetary incentives to farmers.
15. Economic surveys for introducing crop insurance and cattle insurance.
16. Evaluation of State Farms Scheme.
17. Viability of Small Farms.
18. Who are future farmers ?
19. Study of the impact of inequalities on Farm Tensions.
20. Relation between agricultural development and regional disparities.

THE RESEARCH THEMES IN THE FIELDS OF ENGINEERING, TECHNOLOGY AND MANAGEMENT DURING THE FOURTH PLAN PERIOD

By

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1. Rice being the staple food of the major part of our country's population, new targets in its output are being achieved every year. This has already interested the manufacturers of rice milling equipment to remodel and incorporate innovations in the machinery used in this field. This may in turn demand new design and developmental research. It is proposed to conduct a seminar and an exhibition in October 1971 on Rice Milling Equipment in I.I.T. Madras. This may probably help the industry very much. There should be a wide scope for a close study and research in this field particularly in the southern universities.

2. Recently one of my students prepared a forecast of fertilizer demand in the districts of Kurnool and Nellore. This has revealed the glaring lacunae in the data to conduct such scientific studies. With the commissioning of the proposed fertilizer projects like the Tuticorin fertilizer project and others like Madras Fertilizer Factory going into full production, the fertilizer output is likely to more than double in the South. A complete market survey—potential demand. fertilizer dealer network, pattern and habits of fertilizers consumers etc.—will help the industry a great deal to dispose of all that it can produce.

3. In the Co-operative sector a number of sugar and textile mills have come up in all the southern states. It is needless to state that they have not yet streamlined their management in these mills. Research projects may be undertaken by students of management to study their management structure and practices and help them to streamline the entire administrative apparatus by

applying principles of scientific management. This will not only increase their productivity but will also help them to effectively compete with units in the private sector.

4. Recently a student of our Institute studied the application of the principles of operational research in the working of blood banks in the city hospitals. This was widely acclaimed by the Institutions of Industrial Engineers during their last annual convention at Cochin. Similar study and research groups may be formed to help the medical and public health authorities to increase their efficiency.

5. An industrial estate for Electronic industries is to come up shortly in Adyar. This industry could be helped by latest research in designing and development of prototype models. In addition, a systematic market survey for various products proposed for manufacture in the industrial estate will greatly help the industry.

6. Fisheries is another important field where there is a great potential not only for internal markets but also for export markets. Research work can be undertaken in the fields of designing improved versions of Fishing Launches, in processing and preservation cold storage and marketing of marine products both internally and abroad.

7. No systematic research and study of rural markets for consumer goods, has so far been undertaken by any one except in the case of reputed organisations like Hindustan Lever, Tata Oil Mills and Indian Oil Corporation who have a net work of field force. The unexplored rural markets can be fully exploited for various consumer products if a systematic research and survey is undertaken.

8. The Indian Handicrafts are earning a sizable amount of foreign exchange every year. Inspite of the improved markets, the economic conditions of the Indian Handicraft workers still remain backward. Why and where has this surplus income gone, what are the ways and means by which the Indian Handicraft workers can be kept in good spirits and assured of their real wages

and the sharing of profits between the handicraft worker and the middlemen are some of the problems which could be the subject of study and research.

9. The economic and scientific management of plantation industry is one of the most neglected aspect of our economy. Discussion and studies in the areas of determining the productivity of labour, materials handling, transportation and distribution costs and other related areas in this important sector of economy where knowledge is so far lacking will help this sector.

SOME BASIC IDEAS OF RESEARCH IN INDUSTRIAL ECONOMICS WITH SPECIAL REFERENCE TO TAMIL NADU

By

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1. 1 *Research for Tamil Nadu Economy of the 1970s.* The Fourth Five-year Plan of Tamil Nadu is in the making and any effort to tie research programmes closely to the defunct Fourth Five Year Plans of either the Government of India or the Government of Tamil Nadu would be futile. Nevertheless it is in respect of strategies, rates of growth, and extent of real resources mobilisation that one can hope to see a basic reorientation of the Fourth Plans. It is possible, therefore to attempt a representation of the Research Agenda in the light of achievements and possibilities elsewhere in the world, India and in Tamil Nadu.

1. 2 *Indian Economy in an Awkward State.* The Industrial economy of India may be bright if we compare the percentage of output in absolute quantities over 5 or 10 years period in steel cement, etc. Methodologically such comparisons are meaningless except for enthusing the masses. The hard reality which India faces in early 1970s is that we are surrounded by countries organisationally different and ideologically more aggressive whether to the left or right. In the light of the size and aspirations of the peoples of India we find ourselves in an awkward state. A country with 547 million people cannot be ignored by the world with only 3,300 million. We constitute around 1/6 of the human beings on the planet. India as a populous nation cannot be ignored but India as a poor country with the per capita income somewhere in the lower rungs of the world ladder cannot be taken seriously from the economic and consequential military point of view by the rest of the world. This

is the dilemma of India, and as its share, of Tamil Nadu economic growth in the 1970s. India is neither too small to be ignored nor sufficiently prosperous from the economic standpoint to be given its rightful place in the galaxy of nations. It is a poor–big country, trying to become a rich-great country.

1. 3 *Dilemma oj Tamil Nadu.* If rapid industrialisation is the *sine qua non* of success for India, one finds that Tamil Nadu has recorded 4.7% increase in the State Income in 1966-67 as against the All India increase of 0.7% in the National Income [1]. The Revised Estimate for 1969-70 reveal a spectacular rise of 10.5% as against 4.6% in the rate of increase for the country. If the Tamil Nadu rate of State Income increase is to be sustained, we have special efforts to make, comparable to the winning race-horse keeping to its tradition. But there are All-India strategies which give special concessions to backward States. This should not be taken to mean that the High Growth oriented States of India like Punjab. Maharashtra, and Tamil Nadu should not play their role in enabling India to reach the International standards of achievements. How best it could be done in the present background of Indian economy is the dilemma.

2. 1 *Basic principle for the Agenda for Research for Universities and other learned bodies.* Subjects of fundamental importance with long term perspectives like the implications of social change for economic growth may be remitted to centres of higher learning for a basic appraisal. All the ideological implications as well as comparable instances in other countries of the world have to be taken into account in such studies. This requires time and also familiarity with the recent literature in all related disciplines of the subject. It is difficult for a business firm or Government department to get involved in this commitment to the detriment of its immediate demand for producing goods and services urgenly for the readily available market. Besides, fundamental reflections become an ancillary to advanced teaching and research.

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1 Government of Tamil Nadu : *Tamil Nadu* :
An Economic Appraisal.
(Madras 1971) p. 5 ......

If we work at cross purposes in an Industry, or firm or Government Department, it would not help to the attainment of certain targets which have been agreed upon.

2. 2 *Issues of research by the Learned Institutions in Tamil Nadu.* It is possible to identify the implications of changing international economic relationship on the patterns of trade in the years to come. In all developed countries, the universities are given the responsibility of examining the implications of the national policies of different countries on world trade. In Tamil Nadu, our concern should primarily be in respect of general trade with neighbouring countries like Ceylon. Burma, Malaya, Africa and the Far East, besides specific commodity trade with other continents.

2. 3 *The Concept of Area Studies in Universities takes care of the need.* The area studies departments encouraged by the University Grants Commission already implemented by the University of Madras is a step in this useful direction. As regards, the substitutes for commodities in trade with different countries, the major importers and exporters should pose relevant questions to the area studies centre for long term analysis.

2. 4 *Special Role of the Planning Commission of Tamil Nadu.* Whereas each State Government as well as the other agencies within a State are likely to be preoccupied with problems of Inter-State economic relations within India, it would be useful to consider if the Planning Commission of Tamil Nadu in consultation with the other learned bodies could identify problems of long gestation nature for solution and separate them from those which require important and urgent attention so as to share the responsibility for research between Universities and other agencies. Inter-regional trade between Tamil Nadu and other neighbouring States, development of power, linking of rivers, specialisation in industrialisation between the States are some of the Research Projects, in terms of Industries which should be considered in the context.

3. 1 *Labour in Industry.* In this Seminar, the role of labour in Industrial development is perhaps viewed as part of Industrial

research. Partly there is justification for this approach. Hardly 13% of the total labour force in India is in organised industries. Bulk of Tamil Nadu Industrial activity is confined to this restricted class of labour force. In Tamil Nadu according to the census of 1961, the average working population in industries, in manufacturing industries, mining, quarrying etc. was only 8.3%. The position should have improved between 1961 and 1971. Three broad areas of research await attention in this context.

3. 2 *Need to know Scientifically Consumer Working and Middle-class Budgets.* The consumer index of prices for Industrial workers and middle class employees has to be calculated on the basis of family budget studies at least once in 5 years, for major industrial centres. On the basis of such upto-date and scientific knowledge of living conditions of the workers, the Government can anticipate their problems rather than wait for their agitation and demands.

4. 1 *Industrial Productivity Studies in proper perspective: International and Indian.* The conditions of industrial development in the rest of India and the differentiating causes for the differences in wages, productivity and conditions of service should be enquired into. This is of long term significance to bring about interregional equity. Often we speak about the productivity of Japanese labour. At one time the Indian working class was second to none in the world and even to-day the dock labour in Madras or the technical Engineering staff of some of the industries in Tamil Nadu have set up standards equal to the best in the world. An international comparison of the Japanese, German, Russian and American conditions of work, industries and Planning should be undertaken with a view to evolve an Incomes and Price policy. This requires expertise in different disciplines and familiarity with the international comparison. University agencies, supported by the industrialists and Trade Union leaders familiar with International Practice would be best suited in order to carry out these tasks.

5. 1 *Entrepreneurship and Economic Management of Industries.* The present management of Tamil Nadu Industries is largely based

upon tradition and hereditary privileges. In a study of Entrepreneurship in Tamil Nadu by Dr. N. C. B. Nath in early 50s[1] and in another paper by me in 1971[2] it has been found that transition from the traditional and family monopoly to the newer technocratic classes is perceptible though rather dimly. A research as to the place of economic management to Tamil Nadu Industries as distinct from pure business management or personnel management is necessary. Economic administration is a comprehensive term. Research under this scheme would take a total economic view and will not be confined to the repair of existing but outmoded forms of business. The present Institutions for management study and courses of studies are heavily weighted in favour of the American business experience. Largely such models are irrelevant and expensive for India, to adopt. "Polished style", occidental manners, and superficial psychological make-up, conference techniques, are soft options for the remedy of basic industrial malaise of poor countries and not adequate to inspire confidence and partnership in Indian Industries. Managerial exploitation is not the substitute one seeks for the earlier capitalist exploitation [3]. The Burnham's thesis is quite relevant in identifying the errors of restricting industrial practices and studying management techniques in isolation. Four basic studies in economic administration can be attempted in Tamil Nadu.

1. *The role of Entrepreneurs in Engineering.* Enterprises in highly capital-intensive or sophisticated technology based industries.

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(1) NATH, N.C.B.	The Cotton Textile Industry of Madras Presidency. (Madras University, 1955)
(2) SHANMUGA-SUNDARAM, V.	Entrepreneurship in Tamil Nadu (M I D S, Madras, 1971.
(3) BURNHAM	Managerial Revolution, (London, 1953)
	This is a Volume in succession to-though not in the same tradition of—Karl Marx's *Das Capital.*

2. *The role of worker-managers* as in Japanese industries eliminating the unnecessary class of managers. The hypothesis for this research study would be the avoidable managerial expenses in India due to redundant supervisory cost in many Indian Industries.

3. *Economic administration in Government Industries* can take a total view of oscillating, and uncertain emphasis which has characterised Indian economy. At one time the I.C.S. and the I.A.S. Services were expected to provide the best top-administration. Later and upto now the tendency has been to consider engineers as equivalent of management experts and to place them at the apex. The thinking for the near future is that management consultants would take over India's Industries. A problem solving research here is to examine whether a team of engineers, managerial representatives, cost accountants and economists in different combinations of strength depending upon the particular line of Industrial product would give the optimum return of the economy. No one economic administrative solution is meaningful for all activities. Research should be of broad categories of Industrial activity. The National Institute of Economic and Social Research in London has pioneered Studies which have relevant materials to the study of Tamil Nadu Economy as it would emerge in the next decade.[4]

6. 1. *Unemployment Vs. Industrial Growth of Tamil Nadu:* There is a theoretical contradiction between a high rate of capital output and high rate of employment per unit of capital. This controversy popularly known as capital-intensive vs labour intensive, would become real in the next 10 years in Tamil Nadu. Agriculture is already producing near self-sufficiency in food and there will be a temptation to take labour out of Agriculture. However, Tamil Nadu Industries cannot be poised for high rate of growth unless in certain sections at least the use of computers and highly expensive machinery are utilised. That is the way to maintain excellence in quality and uniformity besides adequacy in output.

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(4) DOW, J. C. R. *"The Management of the British Economy"* 1945—1960—(N.I.E.S.R. London, 1964)

6. 2. *A Three Sector Model for Industry*: A three Sector Industrial model: *One*; On international standards of skill and capital combination, (a) for the purpose of exports and (b) for giving demonstration models of International achievement for the people of Tamil Nadu.

Two: All India Standards of skill and capital combination with a view to maintain competitiveness to the Industrial market based upon resource endowments.

Three: Transitional combination with a view to familiarise the rural labour which is not accustomed to Industrial traditions of punctuality, discipline and preparedness to respond to wage incentives and Scientific conduct irrespective of status, or personal connections or pressures of personality.

6. 3. *The Third Sector is the Launching Pad for industrial growth*: The third section of the model is of a preparatory nature for the labour force to get involved in the Second and First sections. Hence the identification of these three sections in Tamil Nadu would be the responsibility of Economist and Industrialist team. The Planning Commission, Universities of Tamil Nadu, Indian Standards Institute with their experience in the Second and Third plans would be suitable agencies for this exercise.

7. *Consumer goods industries*: Surpluses of production of consumer goods cause a glut even in highly industrialised economy where there is a high elasticity of demand for such goods, and remedial action is possible. In India, the position is worse in view of the slender consumer goods demand. Though the potential price elasticity and income elasticity has to be identified, with meagre increases in real income, the break through in consumer goods industries is not within the sight. Production cum market-oriented studies to project into the future the possible demand, and conditions to sustain the demand are necessary. Hire purchase systems, warehouses for consumer goods, trade, the whole-sale or retail trade reorientation are related to the new tempo of consumer goods industries. A new industrial policy is meaningless without adequate and massive supply of consumer goods at lower prices which would become possible through large scale production.

8. 1. *Small Scale Industries Vs. Large Scale Industries* : This distinction has had a temporary purpose and has perhaps outlived the distinction for employment strategy. In agriculture cotton, tobacco, groundnut, sugarcane, vegetables, livestock etc. would take care of a large volume of labour force and the Third sector of the Three sector model for Industries outlined above. The Second Plan inspired this dichotomy of Large and Small Scale Industries and it should vanish during the IV Plan Period. Already we have questions as to how small, the Small Scale Industries should be. Some of the Japanese Small Scale Industries compare favourably with the medium scale Industries of India. Our definition of Small Scale has often hinged on capital invested, labour employed and power used. This triple combination pertains to traditional activities or highly modern industries. If it is of the latter kind, its role is that of an ancillary to the modern large industries of national or international standard. With the elaboration of the Indian Social policy against monopoly and restrictive practices, the ancillary Industries would gradually replace the large industries outside the State Sector.

8. 2. *Traditional Industries vs. Ancillary complex of Industries* : Problems of these Industrial activities need a study in depth. We have numerous enquiries in respect of credit for Small Scale Industries,[1] the problems of monopoly[2] etc. What is required now are studies for the proliferation of effective ancillary Industry and orderly transformation of traditional industries.

8. 3. *Location* : The location of Industies, the past tendency and the present planned policy based on the criteria. The nearness to markets, labour, raw materials etc. and the planning needs of regional balance vs. high rate of growth need study. The idea of district Planning which has become the accepted tool of the Planning Commission of Tamil Nadu would further strengthen methodological base of these locational studies.

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1. Shanmugasundaram, V. *Small Scale Industries and their credit problems.* (*University of Madras, 1971*) Mimeographed)

2. Hazare, R. K. *Studies in the concentration of Indian Industries.* (Bombay, 1965)

9. 1. *Research on the Research in Indian Industries* : Another Background Paper[3] in this series makes out a case for large investments in business and Industries for research purposes. This case needs special attention. During the First Three Plans, Indian Industries did not bear much of the cost in terms of locational studies, profit, inventory stocks etc. The licensing system of India perhaps discouraged such exercises. However, in the IV Plan and V Plan periods, when India emerges as an International economic power it will be helpful to divide research responsibilities of Indian Industries into 2 broad categories.

(1) *The assessment of the pattern and strength of Indian trade in world trade :* This is the obligation of the Union Government with its sources of information from the numerous diplomatic missions, properly corrected by Indian Entrepreneurs, businessmen and Industrialists, by their insight of foreign business.

(2) *Intra-Firm Industrial research in different firms in an Industry :* In each region the State Government should have working arrangement for originating research. The term research unit or statistical unit is often a misnomer in many firms, banks, and other agencies with a few exceptions. Merely edited and filing of published articles, by poorly paid and non-academic office staff cannot constitute a research team. The House of Tatas, Sarabhai's, Escorts etc. in India, and SITRA in South India are some of the exceptions to this otherwise neglected sphere. A study of research needs and the methods of meeiing the demands of the research personnel in Tamil Nadu Industries has to be undertaken. A new movement is required in this respect with the help of Tamil Nadu Government, Intellectuals in Public life, and learned institutions in Tamil Nadu.

10. 1 *The Finance of Industries.* Equity capital which was a mainstay of Industrial finances in the past has given place to large and comfortable borrowing from LIC, ICICI, IFC, IDBI, SFCs. etc. This has created a measure of financial harassment of talented entrepreneurs in Industries by Industrial bureaucrats, neglect of

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3. Mahalingam, N. *Problems in Business Research to be concentrated by Universities and Institutions.* (M I D S, Madras 1971) (Mimeographed)

timely needs and fixation of doubtful economic criteria. A reappraisal of the institutional basis of industrial finance is required with particular reference to

(a) rate of interest;

(b) adequacy of credit;

(c) identification of proper agencies for handling loanable funds with a view to maximise productivity and to ensure the repayment of principal and interest. The money-lenders and hundi dealers appear to be still the final arbiters of Industrial destiny now and this needs remedy.

11. 1. *Foreign investment in Tamil Nadu.* This is an indication of both the efficacy of the Tamil Nadu economy and the potentiality for further development. Each State should identify areas in which it can provide a base for international market oriented industries. If there are more than 2 or 3 States which attempt such a possibility in consultation with the Union Government, wasteful competition can be eliminated. But the spade work must be done by the State Governments. Besides the aforesaid classification of studies for Planning purposes we may think of some of the priorities of industries commodity-wise.

Traditional:

(1) Yarn.
(2) Mill-cloth.
(3) Handloom cloth.
(4) Tobacco.
(5) Oil.
(6) Silk.
(7) Leather.
(8) Drugs.
(9) Agro-Industries.
(10) Transport.

Modern :

(11) Light Engineering goods.
(12) Heavy Engineering goods.
(13) Paper.
(14) Chemicals.
(15) Steel.
(16) Sugar.
(17) Electronics.
(18) Lignite.
(19) Electricity.
(20) Others.

These specific commodity-based studies have to be undertaken and the priority for further development should be on the need for the reconversion of the structure, scale, finance, etc. in the larger planning context. Reconciling the claims of all these commodity studies is the main purpose of Research for industrial planning.

12. 1 Industrialisation as a method of eliminating poverty : The focus of Commissioned research has often been for the benefit of the firm, and at the expense of the community. Abandoning this narrow pursuit hereafter, one should think of wider social goals and justice. Massive production of goods for feeding the population at nutritional levels irrespective of their ability to pay for food, housing at comfortable standards, clothing and travel on terms of equality between the citizens of India, would set the targets for Indian industries in a society committed to the eradication of abject poverty. One more step in this direction in the IV Plan of Tamil Nadu would take us futher in the journey of economic prosperity and welfare for all the citizens of the Country. Each State of India, committed to this ideal, will make for a truly great India.

RESEARCH PRIORITIES IN TAMIL NADU DEVELOPMENT

HOUSING, RURAL WORKS ETC.

By

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PART I

Statement of Problem :

Housing represents one of the basic needs of man which is as important as food and clothing. It determines the welfare of the family as well as the community. In a larger sense, "The house ultimately determines the development of the economy and the material prosperity of any nation". (1961 Census Volume IX Report on Housing).

What then is a house ? The Census Commissioners from 1881 to 1951 defined the house as "a residence of one or more families having separate entrance from the common way. In 1961 Census, a change in definition has been introduced. Accordingly, a Census House should be used either for the purpose of living or work. As a result, there is a decline in the number of houses enumerated. Premises are used for dwelling, shops, shop-cum-dwelling, place of business, school or workshop. It could be inhabited or vacant. It could be a structure or part of a structure. Every one of these will form a Census House without really solving the housing problem. The relevant data regarding buildings and houses in Tamil Nadu State as abstracted from the Census Report of 1961 are furnished in the following table.

PROPORTION BETWEEN BUILDING AND HOUSES AS RECORDED IN 1961 CENSUS.

TOTAL

State/District		*Buildings*	*Houses*	*Proportion of houses to Buildings*
Madras State	...	7,210,283	7,799,674	1.08
Madras	...	166,960	273,418	1.64
Chingleput	...	451,748	745,075	1.05
North Arcot	...	586,407	638,852	1.09
South Arcot	...	642,719	678,773	1.06
Salem	...	875,901	910,673	1.04
Coimbatore	...	735,787	816,855	1.11
Nilgiri	...	96,711	99,833	1.03
Madurai	...	625,235	749,099	1.20
Tiruchirapalli	...	749,795	795,461	1.06
Thanjavur	...	767,396	784,272	1.02
Ramanathapuram	...	581,514	614,122	1.06
Tirunelveli	...	718,567	746,252	1.04
Kanyakumari	...	211,543	216,989	1.03

RURAL

Madras State	...	5,569,807	5,835,929	1.05
Madras	...	—	—	—
Chingleput	...	368,263	381,165	1.04
North Arcot	...	477,359	519,531	1.09
South Arcot	...	564,834	596,145	1.06
Salem	...	744,867	770,631	1.03
Coimbatore	...	550,736	585,751	1.06
Nilgiri	...	55,795	57,081	1.02
Madurai	...	461,625	509,232	1.02
Tiruchirapalli	...	606,751	635,535	1.05
Thanjavur	...	622,669	630,994	1.01
Ramanathapuram	...	437,234	453,886	1.04
Tirunelveli	...	499,628	512,466	1.03
Kanyakumari	...	180,046	183,512	1.02

URBAN

Madras State	...	1,640,476	1,963,745	1.20
Madras	...	166,960	273,418	1.64
Chingleput	...	83,485	93,910	1.12
North Arcot	...	109,049	119,321	1.09
South Arcot	...	77,885	82,628	1.06
Salem	...	131,034	140,042	1.07
Coimbatore	...	185,051	231,104	1.25
Nilgiri	...	40,916	42,752	1.04
Madurai	...	163,610	239,867	1.47
Tiruchirapalli		143,044	159,926	1.12
Thanjavur	...	144,727	153,478	1.06
Ramanathapuram	...	144,280	160,236	1.11
Tirunelveli	...	218,939	233,786	1.07
Kanyakumari	...	31,497	33,477	1.06

We have to evolve an acceptable definition for a house so as to meet the normal requirements of a family where they can live and recuperate.

Rationale For Housing Development :

1. Housing assumes a dual position. It is a capital good and a consumption good. As a result of this dual position, the investing authorities meet with the dilemma of choosing between consumption and investment.

2. Traditionally, construction of houses and community facilities have been considered a necessary but "unproductive" adjunct to industrialisation and urbanisation.

3. Investment in housing contributes to people's welfare and improves their physical environment. This point is considered not as an end in itself but as a means to raise the productivity of the labour force. This dichotomy between productivity and welfare is a false one; one leads to the other. The road to greater material welfare is through greater economic productivity.

In the low income countries, planners concentrate on those investments which pay off in relatively short time. They choose those lines of investment with a low capital-output ratio where a

given capital output ratio produces relatively large additions to supply of goods and services per year. Investments in house have one of the longest pay-off periods and it involves a very high capital-output ratio. As a result planners assign a low priority to housing in economic development programmes.

4. Inadequacy of lop-sided housing and regional development for the utilisation of human resource is maximised side by side by the provision of inadequate shelter for people crowding around industrial locations. With maximisation of utilisation of human resources, the social cost of economic growth is minimised. Therefore, which ever region is able to provide housing the region will have better prospects for industrial growth.

5. The control of rent charged for the houses has a definite bearing on the allocation of resources to this sector of the economy. Should the government control rents and subsidize people's shelter or should the rents be uncontrolled so that resources can flow freely into this section?

One of the short term measures pending the return to normal conditions is the rent control. The objectives of rent control may be enumerated as follows :-

(i) To stimulate general housing demand in order to achieve a high and rapidly increasing housing consumption of the population as a whole. (The general housing consumption goal.)

(ii) To keep down rents of new houses in order to stabilize costs and volume of house construction. (The construction market stabilization goal.)

(iii) To prevent a (considerable) redistribution of income and wealth from tenants to house-owners (the general income-distribution goal) and also achieve a more equitable distribution of real income among tenants (the inter-tenant income distribution goal).

(iv) To help low-income families, particularly such families with children, to compete in the housing market with other household categories. Thus, the authorities want to guarantee these

families a larger fraction of total housing consumption than they would get in a market without rent control. (The housing consumption distribution goal.)

(v) To direct total demand for housing consumption in favour of large well equipped dwellings. (The housing demand composition goal.)

(vi) To dampen tendencies to cost-inflation.

Goals For Housing :

Governments all the world over and in India aim at assuring some minimum or optimum standard of housing either through market mechanism or through official actions. In many cases, the actions of Government contrary to the expressed goals have led to limitation and controls over the resources made available for housing.

There has always been interminable debate in conferences on housing, whether the goal is to be achieved by specific housing policies or by allowing the free market to make decisions in a Laissez Faire manner. It has been pointed out that government action have affected housing in many ways by their (i) taxation of property of income and capital gains, (ii) interest rates, (iii) Land development, (iv) efforts to increase investment, (v) Programmes having to do with availability of labour, wages and prices and (vi) by abridgement of ownership rights.

A public policy should assign different social value judgment to the demand for housing. Some families willing to live in substantial units. Some families may stint expenditure on houses

Government has thus become deeply concerned with the promotion of efficiency in building industry, expansion of supply of skilled manpower, forward planning of construction programmes and the promotion of industrialised buildings. The policy should be directed towards supplementing or influencing the markets in order to achieve socially desirable objectives, both short term and long term.

PART II

Planning And Housing :

The problem of shortage of housing has become more acute with the development of our economy. The migration of the people from rural areas to the metropolitan centres in search of employment, growth of factories and population, lack of adequate supply of development plots, existence of old and uneconomic buildings and shortage of raw materials have aggravated the problem still further.

In Tamil Nadu, during the First Plan period, the subsidised Industrial Housing and the Low-Income Group Housing Schemes were taken up for implementation. Under these two schemes, 1,800 houses were constructed at a total cost of Rs. 56 lakhs. A number of new programmes such as slum clearance, plantation, Labour Housing Scheme and Village Housing Scheme were taken up with large financial outlays in the Second Plan Period. A housing Board was set up for planning, coordinating and guiding the execution of housing schemes. The Third Plan provided for a much larger outlay on housing schemes. The total provision for housing was Rs. 10.20 crores as against Rs. 4.5 crores in the Second Plan.

Under the industrial Housing Programme, 936 houses were built during the First Plan and 1850 during The Second Plan. The Third Plan provided for construction of 5584 houses. However, due to non-availability of building materials and cuts imposed on the building programmes as a result of national emergency, 2900 were constructed at an estimated cost of Rs. 1.44 crores.

The important schemes in the State which are assisted or sponsored by Centre or State Government are :

Plan Schemes :

1. Subsidised Industrial Housing Scheme.
2. Low Income Group Housing Scheme.
3. Slum Clearance Scheme.
4. Plantation Labour Housing Scheme.
5. Village Housing Project Scheme.
6. Land Acquisition and Development Scheme.
7. Housing Scheme for Handloom Weavers.

Non-Plan Schemes :

1. Middle Income Group Housing Scheme.
2. Rental Housing Scheme for Low paid employees of the State Government.
3. Urban Housing Scheme.
4. Rural Housing Scheme.
5. State Housing Scheme.
6. The Co-operative House Mortgage Bank.

A new programme of considerable importance taken up during the current plan is the acquisition of land on a large scale in the neighbourhood of big cities such as Madras, Coimbatore, Tiruchirappalli and Madurai. The object of the scheme is to acquire lands in the vicinity of big towns and develop them into suitable plots for housing. Amenities like water-supply, roads and electricity, will be made available to these plots. This is a centrally sponsored scheme for which loans are granted by LIC. Under this scheme, the State Housing Board has programmed to acquire an extent of about 4,600 acres around Madras, 500 acres in Coimbatore, Trichy and Madurai respectively. The progress of acquisition has however, been hampered due to a number of writ petitions filed by the affected land owners.

Although efforts on an increasing scale have been made in housing during the plan periods, the problem of catching up with the arrears of housing continues to present serious difficulties as may be seen from the following table:

S. 88

NUMBER OF PERSONS PER HOUSE
1901-1961

State/District		*1901*	*1911*	*1921*	*1931*	*1941*	*1951*	*1961*
Madras State	...	5.5	5.4	5.2	5.2	5.2	5.6	5.3
Madras	...	9.2	8.7	8.2	8.8	8.8	12.9	11.7
Chingleput	...	6.4	6.2	5.9	5.7	5.7	5.9	5.4
North Arcot	...	6.4	6.7	6.3	6.3	6.3	6.4	5.9
South Arcot	...	6.9	6.2	5.8	5.5	5.4	5.6	5.2
Salem	...	5.0	5.1	4.7	4.7	4.9	5.2	5.1
Coimbatore	...	4.9	4.9	4.7	5.0	5.1	5.5	5.3
Nilgiri	...	4.6	4.4	4.2	4.3	4.4	5.4	5.0
Madurai	...	5.0	5.6	5.4	5.5	5.4	6.2	5.6
Tiruchirapalli	...	5.5	5.1	5.1	4.9	4.9	5.2	4.8
Thanjavur	...	5.3	5.2	5.1	4.9	4.8	5.2	4.9
Ramanathapuram	...	5.0	5.6	4.9	4.9	4.9	5.0	4.8
Tirunelveli	...	5.0	4.5	4.4	4.3	4.4	4.7	4.6
Kanyakumari	...	4.6	4.8	5.1	5.3	5.4	5.7	5.6

The shortage of housing is estimated at over 90 million residential units for the whole country and some 6 to 7.5 million units for Tamil Nadu alone.

Other estimates have put the funds required for building so many housing units at Rs. 33,000 crores for the whole country and by the same criterion, it should cost over Rs 2,500 crores for Tamil Nadu. These are staggering figures and the raising of resources on such a colossal scale is not within the means of either the Central or the State Government. Hence, the Draft Fourth Plan of Tamil Nadu observes: "The bulk of investment in 'Housing' has necessarily to be in the private sector. Government can only encourage and supplement private efforts apart from providing financial assistance mostly in the form of loans, to those sections of the community who cannot by themselves raise the resources necessary for construction or acquisition of houses. It is therefore, obvious that there has to be a quickening of the pace of the construction and organisation of new residential

colonies near cities and towns to accommodate the middle class, low-income group and the slum dwellers as only a less than half a million residential units have been built during the two decades of planning.

PART III

Policy and Research :

In formulating a policy for Housing programme for the remaining years of the Fourth Plan, the following factors have to be kept in mind.

1. Growth of population at 2.4% per annum, and
2. Recurring depreciation of existing houses at 2% per annum,

Added to this problem of housing is the progressive urbanisation of the State. Tamil Nadu is the second largest urbanised State in India having about 30 percent of the population in Urban areas. The magnitude of this position may be understood when we compare the all India rate of urbanisation 19.8% in 1971.

A few general considerations in relation to the directions in which housing programmes should be developed during the Fourth Plan period may be taken up for investigation :

1. Firstly, housing policy has to be set in the larger context of the special pattern of economic development and industrialisation in Tamil Nadu. viz. locating industries in the periphery of cities and towns and the development of medium sized towns in the decentralised industrial areas and the resultant emergence of 'growth-centres'. Proposals relating to location and dispersal of industries will, therefore, be of increasing importance in the solution of the housing problem.

2. Secondly, it is necessary to co-ordinate more closely the efforts of all the agencies concerned, public, cooperative and private. The need to undertake preparation of master plans for urban areas becomes all the more important. Without these

plans, there is no means of bringing these agencies in evolving the housing programmes together and maximising the contribution.

3. Thirdly, conditions have to be created in which the entire programme of housing construction, both private and public must be so oriented that it serves specially the requirements of the low-income groups within the community.

4. Fourthly, special emphasis must be laid on land acquisition on development. Availability of building site in sufficient numbers and at reasonable rates is essential for the successful implementation of the housing programme. A fair share of the resources in the remaining plans for housing should be devoted to land acquisition and development.

5. Fifthly, the activities of the State Government under the plans have no doubt caused spiralling up of urban rents. The question of bringing down rents so that it may be within the paying capacity of the workers needs further study.

6. Sixthly, in recent years land values in urban areas have risen exorbitantly leading to virtual expropriation of the community and serious hardships to the man of average means. Mr. N. Mahalingam has enunciated a scheme which contains the following integral points which require careful study :

The scheme enunciated six preliminary conditions. They are :

1. Abolition of private lay-outs in cities in the first stage and in all municipalities in the second stage.

2. Legislation to be introduced for the compensation to be paid for the agricultural lands taken for urban development.

3. Urban development with regard to the provision of roads, power, water supply and drainage must be undertaken by the State on a planned basis.

4. The powers of purchase and sale of urban lands must be a State monopoly.

5. The acquisition procedure and laws are to be changed to suit the present temp of development and

6. The process of development can be distributed over a period of ten years.

Organisational Efforts for solving Housing Shortage :

Investigation regarding industrial housing; new establishments with a prescribed limit of paid up capital of Rs. 20 lakhs or more could be placed under the obligation of constructing one-half of the housing required by their labour over a period of 10 years. Where employers are unable to construct directly, the Government and Housing Boards may take up construction and the employers made to contribute towards cost of construction. Some policy should be drawn up for meeting the problem of industrial housing.

There has been a tendency for the growth of suburbs along Railway lines radiating from the city. The result is an agglomeration of houses, shops, and hotels, in no tolerable pattern. This must be put an end to. There is scope for investigation into this problem with a view to minimise its evil effects.

Houses for the Millions :

One factor which is important for the success of any housing is that every person must have a feeling that the house is his own. For this purpose, in all the subsidised schemes, an effort must be made to make every person own his house.

The most pressing problem in the cities is the inadequate supply of good dwellings for all income levels in healthy surroundings at rentals, suited to their income. It has been estimated that about 3 million more tenements are necessary to relieve the congestion in towns and cities. Where and how tenements are to be erected. How to tempt people to go into tenements instead of living in their accustomed slums in the village of their origin. Intense research has to be thought of in this field.

Preparation of Designs for Model Houses :

Suitable model designs should be evolved for the houses providing for basic requirements taking into account the climate, living habits, customs etc. The key-note in designing model houses should be utility coupled with economy and ease of construction.

Investigations have to be carried out regarding techniques and materials for water proof rendering for mud walls, effect of wall and thickness and ceiling heights on thermal insulation, utilisation of gypsum for light weight partition, masonry mortars, hallow bricks and tiles, utilisation of waste products like blast furnace along for the production of light weight aggregates. The influence of climate and regional factors in relation to designs of houses and other aspects of research in housing and construction is essential for reducing building cost and improving the quality of construction. Rural housing cells engaged in designing houses involving use of local materials should be intensified. There is frequently a temptation to resort to houses on urban pattern construction with bricks and cement without sufficient emphasis on the use of local materials, economy of construction cost, cultural tradition and background of the locality and functional requirements of rural life.

Rural Works :

An efficient and organised drive to harness the man-power remaining idle in each village for brick making, processing timber and constructing well-designed and hygienic dwellings with local resources and under the leadership and guidance of the local artisans and craftsmen would go a long way to eliminate the huts and hovels. Such a programme of housing may be dovetailed to other constructive activities as rural water supply, sanitation and cultural amenities.

The following items are well worth considering for research and study with a view to expedite development in those spheres :

I Public Utilities :

1. Rural Electricity supply.
2. Rural water supply.
3. Rural Drainage and Sanitation.

II Services :

4. Roads.
5. Marketing facilities.
6. Education facilities.
7. Health and Medical facilities.

III **Amenities** :

8. Parks and open spaces.
9. Theatre and Recreation spots.
10. Community Centre.
11. Soil erosion and Flood control.
12. Subsidiary occupations and other occupations; for example rural industries, which are labour-intensive, such as brick making, processing timber etc.

It should be pointed out that a few studies of social provision at village level have been made in our country. More studies pertaining to villages on these lines from different parts of India are needed so as to permit regional comparison and establish valid regional norms. This task should engage the attention of modern democratic planners.

Indian agriculture, which is on the threshold of a revolution, provides immense opportunities. The Green Revolution itself has been found to be labour-intensive. The recent Farm management Surveys and empirical studies have shown that "large scale opportunities for additional employment exist within agriculture and that the output of the current labour force would be increased by labour using innovations in agriculture such as from less to more labour-intensive crops, double-cropping, more intensive soil preparation, fertilizing, weeding and spraying, construction of drainage and construction of farm-to-market roads by labour-intensive methods".

The opportunities provided by the Green Revolution should be utilised for solving the problem of unemployment of rural man-power.

HEALTH AND FAMILY PLANNING IN THE FOURTH PLAN

By

MR. J A. AMBASANKAR,

Secretary to Government, Health and Family Planning Department, Madras.

India has now had about two decades of implementation of National Family Planning Programme. In the earlier years, the Demographic and the Family Planning Communication Action Research Centres have played a very significant role. In fact, they constituted most of the programme itself through the design, testing and execution of package approaches to the task of persuading or motivating a large number of couples for contraception. As years passed, the programme became widespread and progress of research could not keep pace with the tempo of the programme. At present, there is not much of a dialogue between the research workers and the programme administrators. The result is that many practical problems in implementation remain unsolved. Sometimes research results have been presented either too late or in non-programme oriented terms or were too unintelligible to the administrator who is already too busy with the administrative work. It is, therefore, essential that the two should be brought together, one identifying the key problems in the practical field, and the other conducting research and offer possible solutions which may be tried in the field and the results fed back to the research workers. This process should be continuous and only then the fruits of research would be passed on to the field officers.

2. Perhaps it is useful to list a few problems in which meaningful research could be conducted. We are aware that the Family Planning Programme is now implemented by the States according to a set pattern prescribed by the Government of India. The staff sanctioned is the same, the inputs are identical and yet there are varying degrees of performance between one State and another in

the country and between one district and another in the same State and between one primary health centre and another in the same district. The programme administrator is at a loss to understand why Family Planning is a tremendous success in one State whereas it *is a miserable* failure in another. He is not able to understand why one block is able to do *extremely* well in vasectomy while the other lags behind very much. Intensive research is very essential to unravel the secrets of success in one unit and the causes of failure in another.

3. The Family Planning Programme is a *target-oriented*, time-bound programme. We are asked to reduce the birth-rate from 40 per thousand to 25 per thousand in a fixed time. For this, targets are fixed for the various methods of Family Planning, for sterilisation, for IUCD and for use of contraceptives. The targets fixed by the Centre for each State has necessarily to be distributed among the various districts. The district administrator in his turn has to pass on this target to the various Primary health centres. At present, a very crude method is followed. The target is just divided in the ratio of the population of each unit. This cannot be a satisfactory method. In fact when the target was so *divided*, we find the performance *of the various units* varying considerably. It is here that the programme administrator looks forward to the research worker to help him to divide the targets among the various units for research in a rational way. It is of course true that there has been large volume of research, but none of them gives any rational satisfactory answer for this purpose.

4. Because of want of communication between the programme administrators and the research workers, there is yet another problem. Government departments do at present collect a mass *of data, data on almost every factor. There is no competent* research worker who could codify the material, much less to interpret this scientifically. Here again, research is called for. To sum up, we find because of the present utter lack of co-operation between research workers and the administrators much of the useful research facilities remain *unutilised*. A mass of data *remains* uncodified and at the same *time* the several problems of the administrators remain unanswered. The urgent, immediate need is to establish such a dialogue which would help both the research worker and the administrator.

5. We may now turn our attention to similar problems in Public Health. Most of the schemes in Public Health are preventive in nature. Vaccination for smallpox inoculation for cholera and so on. Whenever any such scheme is implemented there is the usual resistance from the public, apparently out of ignorance, superstition and possibly inadequate knowledge of the benefits of the schemes. We have, therefore, a small cell called the State Health Education Bureau attached to the Directorate (started in 1960) to conduct research in these social problems. In fact, the Social Psychologist has been awarded a research fellowship leading to Ph. D. in the University of Madras. Researches conducted on the relationship between the knowledge level and the vaccination status have revealed that even among the educated the specific knowledge on smallpox, i.e., period of prevention by vaccination was not found among the non-acceptors. This was brought to the notice of the programme officers and they are instructed to revise suitably the way of approach in implementation of the programme successfully. The latest drive is for a D. P. T. programme. Among the children, the most common diseases are diphtheria, whooping cough and tetanus. Under this programme, children under the age of 5 years are immunised with the triple-antigen vaccine in the primary health centres. Each child is to be given the triple-antigen vaccine thrice with an interval of 30 days. Most of the mothers are not coming with their children for these three doses. There is considerable drop out between the first and the second dose and much more so between the second and third dose with the result that the full immunisation that can be attained as a result of the complete course of triple-antigen vaccination is not obtained by the children.

6. Most of our rural and slum children are suffering from mal-nutrition. Perhaps a large percentage of the diseases in adults also are as a result of malnutrition. With the rapidly increasing population it has not been possible to feed the entire population with either adequate or nourishing food. Intensive research is called for in this field. Research on preparation of real nutritious food from indigenous material within the easy reach of the large mass of poor population is urgent and essential. Departments like Agriculture, Industry, Veterinary, etc. should work in unison to attain this purpose, side by side research and

preservation of foods like meat, fish, vegetables, etc., should also be undertaken. Field studies are essential to the proper progress of research especially in nutrition and the trial of such foods should be conducted in a large cross-section of population like schools, etc.

7. Even in mass programmes like use of the sanitary type of latrines or protected drinking water supply, consumer oriented research or user-oriented research has a large part to play.

8. The Government of Tamil Nadu has taken a policy decision to develop the indigenous systems of medicine, particularly the Siddha system. In fact, a College has been started at Palayamkottai confering the degree of B.I.M. A great drawback in this system is lack of good text books dealing with the various sections of Siddha medicine. It is true that Siddha medicine had its glorious period several centuries ago. The method of preparation of drugs and their uses are buried in the text books which are old, which are not easy for the beginners to understand. Hence, the Institute of Development Studies could help in the advancement of this system of medicine if those literature could be made intelligible for a college student.

9. There is yet another way on which research could be conducted. It is claimed that there are a large number of medicinal plants grown in our forests. It is necessary that they should be subjected to analysis and trial by research workers from the different fields. A botanist should be able to identify a medicinal plant, pass it on to a chemist who could analyse and isolate the active principle for investigation. Pharmacologists should take up trials with animals and if they prove successful, they can pass it on to a physician to conduct trials on human beings. It is only after this long and slow process is done by several of these people, we could, with our measure of confidence, advocate it to the world at large. Such researches though slow and long are called for by a large number of people in the field. The Government of Tamil Nadu have made a small beginning in providing a scheme in medicinal research by constituting a team with the Professor of Chemistry, Professor of Botany, Professor of Pharmacology and the Professor of Medicine, Madras Medical

College. Many more teams are necessary to work on the numerous medicinal plants available in the State.

10. Research on medical instruments and equipment is a necessity at the present moment. Medical engineering department should be a place for research, improving existing instruments, improvising new instruments and manufacturing suitable equipment for the study of the functions of various organs. These instruments and equipments should be so made as to be accurate and easy to use. Skilled research by doctors, engineers, and technicians will yield good results.

GUIDELINES FOR RESEARCH IN HEALTH AND FAMILY PANNING

By

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" More powerful than the tread of mighty armies is the idea whose moment has arrived ".

VICTOR HUGO.

Population explosion and its severe consequences are today's concern not only for the developing countries but also for the developed countries. Those who are concerned with the future of mankind in all the nations have already alarmed the world that nuclear warfare and the world's spiralling population are the two man-made catastrophes which threaten the human race and are a menance to civilization and progress. The first threatens the total annihilation of mankind and the second brings in untold sufferings, deprivation, despair, disease, mal-nutrition, mental retardation, over-crowding with physical and moral decay in dwellings, to cite only some of the tragic consequences in numbers without any control. Nuclear power can be channelized for the benefit of man and it is the responsibility of a small number of selected individuals. Over-population which is now a global problem requires the immediate attention of all people whether married or not.

It has now been recognised that the ultimate objective in family planning is not the restriction of human life, but rather its enrichment and enhancement of individual dignity. Many people think of the population problem only as numbers of people versus available food. This seems to equate man with animal and food with fodder. It is important to see the question of population growth in its three dimensions. It is not only numbers of people versus material resources, but also cultural resources. The third dimension of the population problem is society's ability to satisfy

man's mental, emotional and spiritual needs in addition to bare necessities and comforts, to lead a life of satisfaction and purpose, to achieve in life more than mere existence. Those who are concerned with the quality of life have no choice but to be concerned as well with the quantity. Even if Science by some magic could show the way to feed new millions of people, we still would not have solved the population problem. The moral, spiritual and intellectual aspects of life cannot be omitted until society can offer every individual an opportunity to live—in the fullest sense—as well as to survive. In short we could say that the main objective is to give the citizen of democracy, all opportunities and facilities to lead a healthy life wherein there is a state of complete physical, mental and social well-being.

The answer to the problem of population lies in planning for a small family. The dramatic fall in the death rate of recent years without a corresponding fall in the birth rate is at the root of the problem. There is also substantial agreement on a need to have smaller families as the only effective remedy. However, the big question before us is—How?

The Dynamic nature of the Problem :

In the past quarter of a century, in almost every country of the world, there have been vast changes in many aspects of life, and these changes have come with amazing rapidity. In no area of discussion or activity has change been as marked, perhaps, as in the approach to the so-called problems of population. There have been changes in understanding the nature of the problem involved. The subject of population limitation is losing the aura of sensitivity which for so long forestalled action or even reasonable discussion. There have been changes in the attitudes of people in all walks of life—enormous changes in the attitudes of government leaders and leaders in industry and labour. There have been changes in the attitude of the people themselves. In many countries the economic planners have begun to realise the economic impact of the rapid growth of population on the economic development of their countries. So have political leaders in an increasing number of countries.

There is now a general feeling about the population explosion that if it is not dealt with reasonably it will explode. Robert McNamara, President of the World Bank, writes that what is important to understand is that the misery of the under-developed world is today a dynamic misery, continuously broadened and deepened by a population growth that is totally unprecedented in history. The gap between the rich and poor nations is no longer merely a gap. It is a chasm. On one side are nations of the West that enjoy per capita incomes in the Rs. 20,000 range. On the other are nations in Asia and Africa that struggle to survive on per capita incomes of less than Rs. 700. At present it is encouraging to note the growing sense of urgency about these problems in many countries. There is a growing feeling that time is running out for man and that he will surely be over-run by his own species if measures are not strictly adopted which will drastically deter his willingness and capacity to reproduce. This has led to a rapid supplementation of private efforts by government action or the initiation of a major officially operated programme.

Of late there has been a growing awareness that the population problem is not a mere clinical or biological problem: it is at the same time, social, economic, political, moral, religious, cultural and psychological. Attitudes, motivation, beliefs and values, preferences and local cultural patterns are at the back of this hypersensitive issue. A very significant change is the recognition that rapid rates of population growth influence almost every aspect of economic and social development. There are many population problems—those related to employment, education, providing health services, transport, migration, housing, industrialisation, agricultural productivity and above all in the developing countries that of increasing per capita income.

Small wonder that today the governments of more than half the people in the developing regions are actively concerned with family planning. It must be emphasized, however, that this is not a sole solution to population problems. It is, of course, a base for solution. As the inter-relationship of the many problems associated with rapid population growth become better understood, there will be sounder bases for action on many other fronts.

Continuing dialogues of those in the many fields affected by rapid population increase and continuing action-oriented research are alike important if the complicated nature on the problems involved is to be understood and balanced programmes are to be developed.

Never before in man's history has it been so essential to understand the dynamics of population. The continuing need for research to many inter-related fields is evident. Science can never be content with present methods.

Research efforts should range far beyond biology.

Demography as a fully developed science, remains in its infancy. It is likely that fewer than half the world's births are even registered. And while the crude estimates of birth rates almost inevitably turn out to be too low, it is essential that more precise data be developed in those areas where the population problem is the most acute.

Similarly, there is a pressing need for far more research in the socio-cultural aspects of family planning. There is manifestly a great deal more to population planning than merely birth control. Attitudes, motivation and preferences differ from country to country and this essential research can clearly best be conducted locally.

The Health Theme and Family Planning :

Health has been claimed as a vital component in population dynamics and family planning programmes as early as the beginning of the 19th century. Family health theme was promoted in 1832 by Charles Knowlton, an obscure Physician who lived in Massachusetts. His small booklet entitled "The Fruits of Philosophy" was actually a strong treatise on birth control. As a Physician, Knowlton's interest in birth control was primarily for family health reasons. His proposition was that in order to maintain the health of the mother, the father and the children, fertility has to be reduced through birth control. So strong was Knowlton's belief in birth control that he considered it to be within the ethical responsibility of family medical practice.

The Conceptual Basis for the Health theme in Family Planning :

Health has been a central variable in population dynamics. In a country with high mortality and fertility and with subsistence economy there is to be expected with special and technological development, a gradual increase in the national product and to a certain extent, an increase in per family income. When social betterment is coupled with improvements in environmental sanitation, nutrition, and later on public health programmes, especially maternal and child health programmes, the pandemics of infectious diseases start to recede. One of the results of this early phase of epidemiologic transition is increased health and particularly improved childhood survival. Such an improvement in childhood survival together with parallel developments in the social system relating to better incomes and better security for parents result in the gradual acceptance of fertility control.

This concept therefore describes health as an essential prerequisite for fertility control. In this way health is actually acting as an intermediate variable dependent on social and economic change and influences acceptance of small family norms.

The dynamic relationship between fertility and mortality can be conceptualized in a somewhat different way. There is a cyclical flow from one variable to the other. Starting with sustained high fertility we get a population which is demographically young, and homes which are predominantly crowded with children. Such a situation is usually associated with poor nutrition and poor environmental sanitation, both of which are common in under-developed countries with high fertility. These and a variety of other social and cultural factors set the stage for a pattern of disease which is typical of the age of pestilence and famines. In regard to children the most serious condition is the diarrhoea-pneumonia complex. With under-nutrition so common and with medical care so inadequate the chances are very poor for the survival of many of these children. In face of such high mortality especially among children, it is not conceivable that parents would even think of family limitation.

The cycle just described can be interrupted either at the fertility link or at the mortality link in the chain. In other words it can be interrupted by birth control or by death control.

J. B. Wappans pointed out that first families begin to think about the limitation of children when the first, second or third child fails to die within the first few years of life.

Recently this concept of a causative relationship between a lowered infant mortality and subsequent decrease in fertility has become the topic for much discussion speculation and field research.

Shafflick Hassan conducted a survey in Carion, Egypt, (1963) among a large sample of Moslem and Christian women. While there was an apparent high fertility for Moslem women, the differential almost disappeared when the findings were correlated with the history of infant and childhood experience that the women had. In other words, the higher fertility in Moslem women was due to a higher rate of infant losses by them. In the Christian group, who were somewhat more educated, the fertility was higher still among those who had experience with childhood mortality. Such studies could be profitably undertaken in the Indian set up. It is necessary to understand the perception and folklore of people which make them continue to breed at the present rate despite their continued economic poverty. Poverty breeds apathy and ignorance and is one of the important causes of its own perpetuation. But this is only one facet of a vastly complex situation. While this may explain a part of the resistance to family planning, it does not explain the whole of it. Otherwise the offer of a monetary incentive for family planning would have yielded much better results than it has so far. We must then explore other factors in order to explain the lukewarm acceptance of the family planning programme which (a) seems so obviously to be for the people's own good and (b) is even supported with monetary compensation. There are values which the people have cherished for centuries, which gave legitimacy to the large family and made it not merely good but highly relevant to their socio-economic context. Many children (and especially sons) meant and for many, continue to mean, more hands to work in the fields, security in old age and a chance for the women to gain status in a society which gave her no rights or privileges until she became a "mother". Also since many children died at birth or during infancy, it was important for many more to be born, so that at least a few should

survive. Women were, therefore, married early and procreated till late—indeed for a woman, childbearing in wedlock was the only legitimate occupation. In order to support this way of life a great good was attributed to people who had large families while small families were considered socially inadequate.

It goes without saying that the medical profession in addition to the ethical considerations has a great responsibility in family planning programmes. A partial listing of the ways in which the clinicians, epidemiologists, medical biologists, nurses, midwives, health administrators, health educators, medical social workers and bio-statisticans must be involved in family planning includes :

1. Further and intensified research in reproductive physiology and contraceptive technology with the aim of discovering the 'ideal contraceptive' of at least new methods that may be more effective, less harmful or harmless, easier to administer, less frequently administered with no interference with the normal process of sexual relations and requiring a minimum of motivation.
2. Examination and control of the possible effects of the prolonged use of contraceptive methods especially the hormones, the intra-uterine devices and proposed immunologic techniques.
3. Improvement in methods of dissemination of knowledge about the existing methods of contraception.
4. Research and experimentation with alternative approaches to family planning services using health motivation systems and integrating both the health and contraceptive services.

This is of course besides the routine responsibility of running family planning clinics and providing the services requiring medical attention such as insertion of UD, abortion and sterilization. The medical profession has great educational opportunities whereby many of the target population can be instructed and motivated to use contraception.

From the available evidence for the association between family size and family health the following conclusions can be drawn :

1. There is no doubt that an association between parity and mortality of children exists, especially still birth, prenatal and post-neonatal mortality. This alone can justify the use of the health theme in family planning.
2. The evidence is also growing associating several other abnormalities with family size, both in the parents and in the children. This evidence is more convincing with regard to some diseases than in others.
3. It seems therefore highly desirable to carry out more careful studies in various cultures to further determine and characterize the relationship between family size and family health.
4. Further controlled studies are also required to assess the impact of health programmes striving to improve the standard of survival on programme acceptance in family planning.

Such studies are very valuable and it should be encouraged.

RESEARCH PRIORITIES IN TAMIL NADU FOR STEPPING UP THE QUALITY OF FAMILY LIVING OF THE CONSUMER

By

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The objectives and process of national development have been designed to improve the quality of life of all the citizens. Economic growth and progress with social justice are the aims of our development plans, which can be implemented effectively only when the participation of the people is vigorous and widespread. In the attempts to increase the levels of living, the role of the individual as a consumer needs to be recognized. The chief goal of consumer oriented research should be the well being of the individuals and families through increasing their knowledge, resources and abilities. For this purpose, an understanding of the immediate environment, the physical, cultural and social milieu, aspirations and motivations of the consumer is necessary. Such an understanding would provide a framework for evaluating current research programmes and projecting into the future the direction needed to make research truly consumer oriented.

The relationship of applied research to the application of research is not a simple process, but rather an inter disciplinary activity of great complexity. It takes place at the interface between knowledge and action. The experience of industry and national science laboratories has shown that successful application of applied research is very difficult in the absence of a close and continuous interaction between those who are doing the research and those who are expected to use the results of research.

The policy makers of today regard development as primarily a matter of economic growth. The pressing imperatives of increasing Gross National Product, trade and so forth, push the concerns of the consumer to the background. But if development

is to be viewed in terms of human welfare, the consumer is the central factor and the ultimate aim of development must be the improvement of his quality of life. This cannot be achieved by economic growth alone. The specific goals of consumer oriented research, then, are to improve :

I. The conditions contributing to man's psychological and social development.

II. The conditions contributing to man's physiological health and development, for maximum work efficiency and economic productivity.

III. The physical components of man's near environment—housing, clothing etc.

IV. Consumer competences and use of family resources, and

V. The quality and availability of community services which would enrich family life.

Goal I Improving the conditions contributing to man's psychological and social development :

The home, family, school and the community provide the foundation for the psychological and social development of individuals. Their roles in today's changing society need to be studied from all angles. Some pointers for research in this area are :

1. Conditions which influence happiness in the home.
2. Contribution of the home and school towards the social development of children.
3. Effect of parental attitudes of mother's education and employment on child's achievement and behaviour.
4. Impact of family planning in the rural and urban areas.
5. Education of children and adults for family living.
6. Traditions and family living.
7. Problems of old age.
8. Conflicts between parents and adolescents—The generation gap.
9. Attitudes and aspirations of adolescents.
10. Role of balwadies in the rural and urban areas.
11. Evaluation of literature on family life education.
12. Problems of working women.

Goal II. Improving the conditions contributing to man's physiological health, nutritional status and development for maximum work efficiency and economic productivity.

The modern concept of health is far away from the belief that health is absence of disease or infirmity. Health is a positive quality and encompasses the total physical, social, mental and emotional well being of individuals as conditioned among other factors, by nutrition.

Economic growth is essential to the abolition of hunger and malnutrition. So long as the masses remain in poverty they cannot buy the food they need. Malnutrition is a proven killer of young children. It can wreak havoc on a country's growth potential by prematurely shortening the lives of children. The resources that have gone into rearing them during their brief and pitiful passage through life, have been simply wasted, for they will never grow up to make a productive contribution to society that would have been a return on those resources.

In India today, there are about 75 million infants and children in the 0—5 year age group. Half the population of the country consists of growing children below 15 years age. They constitute the future working force—skilled and unskilled—of the nation.

Malnutrition in the early years reduces notably the productive capacity of adults. Physically, they lack the energy and stamina which are essential for the satisfactory performance of work. Furthermore, malnutrition might lead to mental retardation of the young. Chronic and severe malnutrition in childhood increases the chances of children becoming poor readers and poor writers. This in turn, may lead to defects in neurointegrative functioning, school failure and subsequent subnormal adaptive functioning. This chain of events will have a 'spiral' effect on the society: A low level of adaptive functioning, lack of modern knowledge, undesirable social customs, infections and insufficiency of food, produce malnutrition, which leaves a large pool of survivors who will function in suboptimal ways.

Malnutrition decreases a worker's productivity. It lowers his resistance to disease and relatedly increases his rate of absenteeism

from the job. Accident rates are also higher among the malnourished groups who tire easily and quickly. Apathy, lethargy, and lack of initiative are the common characteristics of the poorly fed groups. In the past, this apparent sluggishness was frequently attributed to laziness, indolence, fatalism or other so called "ethnic traits". The FAO has reported that those countries with the lowest per capita daily protein and caloric consumption, are also those with lowest productivity.

Deficiency diseases are extremely insidious in that they sap the vitality of people to a considerable degree. Many people who presume that they are well, are victims of several deficiency conditions. Certain nutritional deficiencies such as acute inadequacy of vitamin A, which ultimately results in blindness, limit opportunities for productivity. In India, there are at least one million preventable cases of blindness attributable to this cause alone. The blind become a drain on the society with little or no opportunities to contribute to it. Yet within an expenditure of a few paise a year, such blindness could easily be prevented. The economic losses accruing to the society, in terms of the skills of rising generations, would undoubtedly be of such great dimensions as to seriously cripple the whole development effort. The medical costs necessary to treat the effects of malnutrition, either through hospitals or health centres, are many times greater than the cost of providing the necessary nutrients to prevent malnutrition initially.

Solution to the problem of malnutrition is so urgent that it cannot wait for a satisfactory level of economic growth to be achieved. Neglecting it, will mean holding back economic growth for an indefinite period. In fact, certain aspects of economic growth could be achieved faster and more effectively, if nutritional programmes aiming directly at bettering the social conditions of people are undertaken. People should have the food they need to keep them in good health. People have to be educated in the kinds and quantities of food that they and their children need, and how to produce or procure the nutritious foods at minimal costs.

Our efforts towards improving the social conditions are being thwarted constantly by over population. Since the population

explosion has been accentuated by the fall in death rates, it may seem unbelievable that improved nutrition, which would help save even more lives, especially among the young, could help in solving the problems of population explosion. But there is definite evidence that it could. For the continued thrust of the population explosion is far less due, than is often supposed to be, to ignorance or lack of contraceptive methods. The fact is, that a large number of people, want to have more children than either they or society can afford, in order to be sure that at least one or two would survive. If measures were taken to increase greatly the assurance of the first two children as a result of better nutrition, the parents would feel much less impelled to have further children, and would accordingly be far more psychologically receptive to the ideas and methods of family planning.

In the immediate future, research endeavours must become more responsive to alleviating hunger and malnutrition. The broad areas of research related to this goal are :

1. Nutrient requirements and metabolism of different groups of Indian people in various stages of life.
2. Methods of assessing the nutritional status of people.
3. Food quality, composition and safety.
4. Improving the food patterns and habits of families.
5. Evolving desirable food service systems, and,
6. Nutrition and related variables.

1. Nutrient Requirements and Metabolism :

(a) Determining the optimum amounts of calories and nutrients required for growth and maintenance of physical and mental well being. Their sources, types and cost.

(b) Effects of variables such as activity, stress and disease on the needs for various nutrients and calories.

(c) Minimum and maximum range of nutrient requirements for all stages of growth, maintenance of health and reproduction.

(d) Effects of exogenous hormones and oral contraceptives on nutrient requirements and utilisation.

(e) Effects of genetic variables on nutrient needs and utilisation.

(f) Inter-relationships of various levels of different nutrients in meeting requirements.

2. *Methods of Assessing the Nutritional Status of People :*

Simple methods are needed to assess the nutritional status of individuals and population groups in the villages. These must be dependable and valid. The following areas require special investigation:

(a) Relationship between physical, mental and emotional health and nutritional status.

(b) Refinements of methods for measuring nutritional status as indicators of acute and subclinical nutritional deficiencies.

(c) Evaluation of nutritional status of individuals and selected populations group. (Rural, economically disadvantaged, nutritionally vulnerable groups viz., pre-school children, expectant and nursing mothers.)

(d) Correlation of dietary intake with nutritional status.

(e) Assessment of the impact of sponsored programmes (like the Applied Nutrition Programme) providing meals for infants, pre-school and school children on their nutritional status.

(f) Continuing investigation of all possible avenues for improving the nutritional status of the population with special attention to the needs of the disadvantaged segments of society.

(g) Methods of nutrition education.

(h) Comparison of the effectiveness of innovative educational campaigns for disseminating nutrition information.

(i) Techniques for measuring the effectiveness of nutrition education.

3. *Food Quality, Composition and Safety* :

(a) Composition, nutritive value (raw and cooked) wholesomeness, eating quality and cost of foods which are widely consumed, including the new hybrid strains of cereals and pulses.

(b) Development and refinement of methods for determining food composition of raw and cooked foods.

(c) Development of protein food supplements.

(d) Factors affecting wholesomeness in storing, preparing, holding, and serving food on home and institutional settings.

(e) Effects of commercial food processing and packaging methods on final food quality, nutritive value, safety and cost.

(f) Determining consumer needs and desires for foods in new forms. Need for partially and fully prepared "ready to eat" foods.

g) Inter-relationship between extent of processing, market form, and final product quality with consumer acceptance and economics of utilisation in homes and feeding establishments (like hostels).

4. *Improving the food habits and food patterns* :

(a) What factors influence food patterns? Identification of factors which determine food preferences and practices with special emphasis on the social, cultural, religious and economic factors.

(b) Values held by various population groups concerning food; ways in which these values are mediated through food practices.

(c) How can people be motivated to modify eating habits to obtain adequate quantities of the essential nutrients? Techniques which are effective in motivating people to change their eating patterns.

(d) Extent of distribution and use of information about food fallacies: Methods of counteracting mis-information.

(e) The role of food in meeting the psychological and emotional needs of people.

f) Effects of sensory perception, psychological and environmental factors upon food acceptance, and dietary habits.

5. *Evolving desirable food service systems* :

(a) Factors which determine the cost, acceptability and nutrient contribution of meals in catering institutions.
(b) Role of dietitions in institution management.
(c) Standardised recipes for large scale (quantity) cookery.
(d) Nutrition education in hostels and hotels.

6. *Nutrition and related variables* :

(a) Effects of short or long term nutritional deprivation on different aspects of health and human capacities.
(b) Relation between prenatal nutrition and early diet of the child to mental and physical well being throughout life.
(c) Relation between prenatal nutrition and subsequent health of the mothers.
(d) Nutrition and working efficiency.
(e) The economics of nutrition (cost of malnutrition).

Goal III—Improving the physical components of the consumer's near environment :

The immediate environment should satisfactorily accommodate the consumer and his many activities as an individual, family member and citizen. In addition, it should provide energy and stamina for functioning, comfort, contentment, health and economic, psychological and aesthetic satisfactions.

Recently there has been great interest in the possible relationships between blighted environment and blighted human beings. Information about the impact of environment on man's nature, particularly in the light of what we know of pollution and biosphere. must have high priority, if society is to correct the damage already done.

The broad research problem areas related to this goal are :

1. Housing	...	Human needs, socio cultural aspects, aesthetic aspects and economic aspects.
2. Home Management	...	Problems in managing the household.
3. Clothing	...	Human needs—socio cultural aspects—economic aspects. Creation and design. Textiles and textile products. Properties and performances.

1. *Housing* :

Investigations are necessary in the following aspects :

(a) Role of housing in influencing and meeting individual and family needs and aspirations—Housing as symbol of social status.

(b) Development of new concepts of space, with emphasis on storage, task performance, leisure activities and anticipated technological changes.

(c) Effects of deprivation of housing on man.

(d) Relationship between over crowding in housing and physical and mental health.

(e) Designing and evaluation of housing proto types, housing colonies as they serve the needs of families at various income levels, sizes and composition in the various life cycle stage.

(f) Assessment of the human response to low cost single unit and multi unit housing designs.

(g) Impact of single type neighbourhoods on socialisation of children.

(h) Economic benefits of various housing patterns.

(i) How to reduce the cost of house construction—economic planning, management of labour, use of minimum materials.

(j) Standardisation of storage units and working units in the kitchen and other rooms.

(k) Testing the efficiency of interior finishes.

(l) Study of housing in relation to family structures.

(m) Improving the health and sanitation aspects of housing.

(n) Time study on labourers engaged in building work.

(o) Effects of new technological changes in house building—new materials used in the construction of houses upon the quantity, quality and cost of available housing.

Criteria used by builders and developers in determining design of housing for different income groups.

(p) Assessment of the economic and qualitative benefits of mass produced housing units.

2. *Home Management :*

(a) Financial allocations for home making.

(b) Evaluation of the objectives and practices in relation to income levels and expenditure patterns of different population groups.

(c) Comparison of different household budgets.

3. *Clothing :*

Because of the competition within the textile industry and the loss of coordination between the producers and suppliers, the consumer often encounters problems he cannot solve. The research needed in this direction are :

(a) Consumer needs and preferences for specific characteristics in textile products, including style and level of performance and maintenance.

(b) Properties and performance of different textiles.

(c) Clothing requirements related to such factors as climate, custom, age and fashions of different socio economic classes.

(d) Development of test methods which will adequately predict clothing performance.

(e) Establishment of research based standards, to assist low income families meet minimal levels of social acceptance with respect to clothing.

(f) Assessment of the complex factors which determine the portion of income to be used by individuals and families for clothing.

(g) Establishments of standards for clothing sizes through research on anthropometric measurements and proportions of all segments of the population.

Goal IV—Improve Consumer Competences and Family Resource Use :

If we are to raise our standards of living and efficiency of our people, we will have to make them better consumers through education. The consumer today is often forced to make decisions without adequate and valid criteria. Better ways must be developed to provide him with basis for sound choice making and discrimination between valid information and misinformation. The research needed in this direction are :

(a) Level of consumer's knowledge about legal protection in the market, consumer's use of legal resources and channels for reporting unfair and illegal treatment in regard to rights, goods and services. Implementation of the laws relating to consumer protection and their adequacy.

(b) Assessment of extent to which needs for consumer services are being met and implications for new or modified services.

(c) How far is the ISI effective in the standardisation of consumer goods ?

(d) Consumer choice making and behaviour—identification of factors associated with choice making by different socio economic groups.

(e) Consumer and marketing system-specific characteristics of consumer preferences and their influence on the market.

(f) Evaluation of different methods of providing information to consumers relative to availability and quality of goods and services—Role of labels, advertising.

Assessment of use of consumer information (grades, standards) by consumers in the selection and use of goods.

(g) Role and scope of consumer resistance movements.

(h) Working of Consumer Cooperatives, Super Markets and Fair Price Shops in urban and rural areas.

(i) Credit facilities available to the urban and rural consumer.

(j) Food adulteration and the consumer.

(k) Development of feasible tests for enabling the consumer defect quality of goods.

(l) Standardisation of weights and measures.

(m) Problems in consumer education.

Goal V—Improving the quality and availability of community services which would enrich family life :

The services the community can render are numerous. How far are our people conscious of these services and realise their duties to use them wisely ? Some suggestions for research in this field are :

(a) The services available and how far they meet the needs.

(b) How to provide more services based on the needs of people—what are the resources needed ?

(c) How to inculcate habits of utilising public property carefully.

Conclusion :

The best of objectives, plans, goods and services will not benefit the society, if the consumer is not aware of their existence. Production to be purposeful needs to be based on consumer behaviour. The consumer is the pace setter for production towards prosperity. Consumer education and consumer oriented research will go a long way in helping people make the best use of the available resources.

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UTILISATION OF SOCIAL RESEARCH

By

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No product seems to have such a low demand in the market as that of social researchers. A Sunday issue of The Hindu (in 1969) referred to a "volume in a light-blue dust jacket" that was lying on a table in a Department of a State Government for a year. Though the study was jointly sponsored by the Government and the research institution, it could not get official patronage as the report contained "nothing new" from the point of view of the Government officials. There are many such instances of neglect of research studies by consumers.* But this is only one side of the coin. At the same time many pragmatic consumers blame the academicians as unrealists and arm-chair theorists. This is not without truth too. Whether due to reluctance of consumers to face research findings or apathy to utilise research know-how, or the inability of the producer to sell his product to its potential users, there has been incredible gap between production and utilisation of social research in our country.

Utilisation of social research depends on many factors: Consumer's awareness of problems in the setting, concern for change, conviction in the ability to change, and scientific attitude. On the part of the research producer, certain requirements are to be satisfied. Sensitivity towards problems in the social environment, formulation of workable solutions, ability to reach the consumer and communicability.

ROLE OF SOCIAL RESEARCH IN INDIA

In a developing society like ours, for a long time to come, social researchers will have to give more emphasis to applied and

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* 'Consumers' refer to the various departments of the Government; industrial, business and commercial undertakings; and organisations and institutions engaged in health, education, welfare and other activities.

developmental research. Social research must direct its efforts to social issues, the solution of which cannot be delayed. Nobody denies the need for theory-building and the importance of fundamental research, but what is under-scored is the need for balance *between theoretical pursuits and developmental priorities.* Today we need research to help formulate policies and developmental programmes, and to evaluate on-going programmes, Our pursuit for knowledge must not be at the cost of our developmental needs.

COMMUNICATION

Lack of communication has been the greatest handicap for research utilisation, even by researchers themselves, not to speak of consumers. Due to this fact many good studies have gone unnoticed by potential consumers. Proper and effective communication between producers and consumers of research is a must for research utilisation.

DOCUMENTATION

A major hurdle in bridging the communication gap is the absence of documentation: For instance, in the case of Madras City, one is at a loss to find out the number and types of studies conducted. Serious attention may therefore be given to documentation of research studies.

PRODUCER-CONSUMER DIALOGUE

Research Utilisation Conferences are helpful in finding out ways and means of utilising research. The conference organised by the MIDS and the ICSSR is a laudable effort. Such conferences may be supplemented with *Research Review Conferences* of one day's duration. These may be problem-wise. To avoid wastage of research efforts, it may also be desirable on the part of research scholars and institutions to consult potential consumers before selecting problems of applied research.

RESEARCH BRIEF

Many a time even well-informed consumers find it difficult to interpret the statistical analysis of the researchers. Often the research reports are lengthy and consist of many cross tables with more variables; but the potential user may not have the patience to go through or may have difficulty in digesting the findings of the report. Most of the research reports are consulted by academic persons and are subject to academic review. Naturally, the researcher may have more concern for his reputation in the

academic field and quite obviously he does not give much attention to the user's problem. An important link between the producer and consumer is the news media. But often much of the research work is published in periodicals or professional journals which are most often not consulted by many consumers. And in many cases, the consumers complain that the products are presented in too much of an academic jargon that they are often perplexed to understand the actual findings. Journalistic surveys are popular and widely read. As it will not be academically fair for social researchers to conduct such surveys at the cost of statistical precision, researchers may write journalistic articles for mass consumption. However this may not be feasible in all the cases either due to the inability of the researchers to write journalistic articles or due to difficulty in getting such articles accepted by news papers as news papers normally have their own priorities. The most practicable solution under such circumstances is the preparation of Research Brief. A Research Brief may summarise the study's objectives and scope, coverage and methodology, important findings and implications for action. It may not exceed three or four pages.

RESEARCH UTILISATION CELL

The creation of the State Planning Commission by the Government of Tamil Nadu is a welcome sign. As research is the basis for planning, a Research Utilisation Cell may be attached to the Planning Commission which may also be entrusted with documentation of research studies. The Planning Commission may also consider the constitution of a *Standing Research Advisory Committee* with representatives of Universities and non-University institutions engaged in research.

CERTAIN RESEARCH PRIORITIES IN TAMIL NADU

1. *Rural Development.*

Though it will be unfair to conclude that our rural community development schemes were a failure there is no denial of the fact that the community development projects did not yield the desired results. An important reason for this setback is the failure to secure active co-operation of the people in developmental efforts. In this context, I may cite an example. A study conducted by the Madras School of Social Work in three villages

of Tamil Nadu in July-August 1970 revealed that the general economic situation as well as the extent of agricultural operations were far from satisfactory. On investigation, it was found that only 16 percent of the 190 respondents reported to have been contacted by the extension staff of the Panchayat Union and 17 per cent of the households possessing land could obtain financial or other assistance from the Union. Majority of the respondents reported ignorance of the various facilities that were being made available to agriculturists by the Panchayat Union. While the Panchayat Union officials complain about the lack of interest on the part of the people, they seldom realise their failure in securing active participation of villagers in rural development programmes. At a time when 'green revolution' offers great promise and the State is concerned with agricultural and rural development, social research can play a crucial role in finding ways and means of ensuring community involvement and minimising resistance to innovations. The adaptability of people to sponsored change and the social consequences of such change is worth-exploring.

2. *Health and Family Planning.*

Inspite of the best efforts of the State and voluntary bodies in promoting family planning, population of the State continues to rise in a disturbing way and in the next three decades the population of the State is expected to double.

With the enactment of the Medical Termination of Pregnancy Act, a new dimension has been added to the health and family planning programmes. It is said that about six million abortions have been carried out every year in the country mostly in an unauthorised way. With the enactment of the Act there is likely to arise great demand for advice and service from couples intending to terminate unwanted pregnancies. Non-availability of or delay in rendering counselling and medical services may encourage commercial abortion operators and other vested interests. It is also likely that the Act may make people apathetic to regular birth control measures and women with unwanted pregnancies may resort to frequent termination adversely affecting their health.

Our family planning approach is isolated from health programmes. Though community health approach has been accepted in many countries instead of the traditional clinical

approach, it has been been much neglected in our country. Linking family planning with community health will not only be more acceptable to the people but also will be desirable from the point of health of the people. To go one step further, an integrated approach of health, family planning, education, recreation and welfare would be the most ideal scheme.

It is needless to state that the acceptance of 'small family' norm and practice of family planning methods, community health, and abortion are areas necessitating extensive social research.

3, *Urban Development*

There are about 602 slums in Madras City with a population of about 6 to 7 lakhs out of the total population of about 25 lakhs (1971 census). It is estimated that the population of Madras City will be double in the course of the next twenty years necessitating concerted action to tackle problems of housing, sanitation, water supply and sewerage besides educational, health, recreational and other community needs. Slum clearance and prevention of the creation of new slums, and planned urban development of this growing metropolis are stupendous tasks. These schemes not only require huge resources but also call for co-operation from all sections of the public if we are to avert urban disaster. As rightly pointed out by the Slum Clearance Board the issue is "not merely construction of tenements and rehabilitation of slum dwellers"; securing the confidence of people and persuading them to accept "our method of rehabilitation and settlement" is the crux of the whole scheme.

4. *Industrial Productivity and Industrial Relations.*

The number of man days lost in our industries due to work stoppages, absenteeism, labour turnover, accidents and other factors is alarming. Research to locate determinants of industrial peace, productivity studies, man power research, and studies on problems like absenteeism, labour turn-over and accidents are therefore imperative.

5. Unutilised and underutilised man power.

6. Welfare of the socially underprivileged, and handicapped.

HOW THE UNIVERSITIES AND RESEARCH INSTITUTIONS CAN TAILOR THEIR RESEARCH IN THE LIGHT OF FOURTH FIVE YEAR PLAN PRIORITIES FOR TAMIL NADU

By

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The Universities and Research Institutions are frequently blamed for conducting research in ivory towers, remote from the realities of the work-a-day world. Professors and Directors organising research are described as arm-chair academics, living and having their being in a cloistered world of their own imagination. Fundamental research is their chosen field, so adored that any thing less, not at the centre and core but even in the periphery of it was treated as *infra dig* to undertake. Some critics attribute to them not high-brow attitude but rank ignorance of their role in relation to the common but acute problems of the ordinary business of life. We cannot brush aside this volley of criticism as absolutely baseless. The purist among the scientists considers that his function is to analyse and not advise, describe and not prescribe; invention is not his motive but the end-product of his work. In one sense it is correct for, if the scientist forsakes fundamental research, it will be like salt losing its savour.

(2) But in this chosen area, the selection of subjects appears often to be conceived to impress rather than to invent, to mystify rather than to clarify. To cite a few examples from the field I know, young researchers in Economics choose such subjects as Theories of Trade, Growth Models, Theories of Monetary and Fiscal Policy, and Unemployment each an Omnibus theme which invariably reduces itself to *omnium gatherum.* Time was when research scholars produced their *magnum opuses* e.g. Bryce, his Holy Roman Empire and Edward Chamberlin his Monopolistic Competition. But that age is past. This kind of Choice errs in over vaulting ambition and the energies spent get diffused,

nor have they usually any relevance to the immediate and exacting problems that confront the business man and the administrator. Research is sometimes derisively defined as an endeavour to know more and more on less and less, but let alone the derision, it embodies a kernel of truth and points up the way to fruitful research. These are points to remember when attempts are made to tailor the research work at the Universities and Research and Research Institutions to meet the needs of planned economic development.

(3) The functions of the University Research Departments (of all faculties) and the Research Institutions may be broadly classified under two heads : (i) fundamental research to be assigned to Scholars with a burning derive and zeal to face the hazards and to enjoy the delights of exploration and invention. (ii) Applied research with reference to (a) public sector projects, problems and policies and (b) private sector enterprises and progress. It would indeed be a bad day for a country if her scholars and scientists took a narrow, absolutely utilitarian, short view and jettisoned fundamental research. That the flame of pure knowledge should be kept burning all the time, ever brighter, needs no elaboration.

(4) The second, not necessarily secondary, function needs to be spelt out in detail. Applied research is essentially problem-oriented. During the implementation of even the most meticulously designed projects, problems do crop up. Best laid schemes turn away. Without probing into the reasons, suffice it to say that these problems provide a fertile field and open up an endless vista for fruitful research. Similarly the execution of development projects in the private sector too run into difficulties, throwing up problems for investigation. A few illustrative cases from both the sectors may be briefly cited.

(5) The gap between achievement and targets in production, resources mobilisation, employment, investment etc., constitutes the critical area, bedevilled with problems. How the agricultural scientists at the various agricultural research stations contributed to the attainment of the target in paddy production testifies to the value of intensive, purposive research. Now they are engaged in

evolving new strains of cotton, millets and oil-seeds, presently they will turn to pulses and the saga of research will ever continue. The success story of the green revolution is too well-known for us to linger any longer in the agricultural sector.

(6) In the small-scale industrial sector, the handloom industry persists to be a problem child. Unsold stocks worth crores of rupees every year are a "hardy annual". Yet the project for its development, particularly from the employment and welfare points of view has been in operation for perhaps the longest period. Apart from market research, it is necessary to find out the cause of this sad plight, whether it be high production costs, poor quality of the product or change in consumer preference in the domestic as well as foreign markets. Again, despite attractive incentives, the project for expansion of the power-looms, is still dragging its feet. Is it because the handloom weavers are really ignorant of its merits and benefits? Or are they in the stranglehold of vested interests? Or is it a case of sheer inertia? Research alone can reveal the real reason.

(7) Take the case of the Industrial Estates, designed to carry industrialisation into the country side. They have tended to cluster around cities and larger towns and remain islands of activity without producing the expected spread effects. Why? A research study alone can answer this question. The Rural Industrial Development Blocks show varying rates of progress. A comparative study of the most and the least progressive blocks will be relevant and rewarding.

(8) Turning to a giant public sector project, we find Neyveli Lignite Corporation incurring heavy losses year after year despite its financial feasibility reports of experts. The growth of a number of ancillary industries in the region and around is a consummation to be devoutly wished. A study in depth is in order to find out (a) whether its losses are due to technological reasons, high labour cost or huge over heads and (b) Why new industries refuse to mushroom in the region as anticipated.

(9) In the large-scale industrial sector, textile mill production is seriously hampered by the emergence of the so-called sick mills. Technologically all the textile mills should be at the same

level of efficiency; external economies are also equally available to all the mills, say, at Coimbatore; yet why are some mills healthy and some sick ? Case study of the latter together with the former as control units may reveal the cause as well as cure. Chemical and other electricity-intensive industries attribute their slow rates of expansion to stiff power tariff, rising transport costs and heavy fiscal burdens. Are similar industries in other States free from such problems ? Research into the working of the local and sister industrial units outside with a team of technologists, cost accountants, economists and others is called for to understand the true position and to eliminate the bottlenecks. Then there are a number of factories which are working below installed capacity. This also calls for an inter-disciplinary research project.

(10) In the sphere of education, it is true that elementary schools and the school-going children have phenomenally increased. If these children relapse into illiteracy, the statistical facade may be imposing but real achievement disappointing. An evaluation study may be appropriated. The growing unemployment of engineering graduates, contrary to expectations poses another problem for research. Again in the family planning programme, the causes for the wide difference in its impact between rural and urban sectors and between districts and taluks demands an explanation by means of a special survey. What is the reason for the progress of some of the backward communities and some sects of the scheduled castes while some others lag far behind when the social welfare programme has been the same for all ?

(11) In the co-operative sector, financing of agriculture, small-scale industries, performance of marketing societies and development banks reveal glaring differences in the various districts. Best run societies and dormant ones should be studied to understand the causes for performance differentials.

(12) Similar instances may be multiplied in the fisheries, forest, animal husbandry and social welfare departments. However, the foregoing instances would amply prove that there is no dearth of problems demanding urgently careful study and research on lines as will be relevant, meaningful and directly subserving the planned development of the State.

(13) Apart from these industrial and sectoral studies there is great need for district Techno-Economic Surveys to assess the natural, capital and human resources available and to provide guidelines for their optimum development. This programme of work cannot stop with a bench-mark survey. Periodical surveys will be necessary to measure the growth record the changes and indicate the appropriate new lines of development. The significance of this field of research can be well appreciated when it is known that from the lip-service stage, the doctrine of "planning from grass roots" has become today a live principle planning right from the villages through blocks, taluks, districts upward to the State and the country. These district surveys have another important objective. It is freely and easily suggested that in the rural areas, growth poles should be developed to diffuse industries. Then District Surveys will serve to identify the growth points. Maximum utilisation of the natural resources and full employment being the objectives Man-Power Survey with a view to training and deployment will be an essential pre-requisite to planning. Thanks to the dynamism already imparted to the economy, which at one time was described as "static economy in motion" as changes occur frequently and these survey too will have to be repeated to gauge the changes.

(14) There is another problem which is State-wide. It is the attitude to change, innovation, risk-taking, profit-making and in one word entrepreneurship. The response to changed techniques, subsidies, loans, aids and what not provided or propagated by government agencies to accelerate the pace of growth, varies from taluk to taluk and from community to community, the scheduled tribes trekking far behind the average or median citizen. The psychological barriers against change, being the biggest road block, studies of the human behaviour and complexes by sociologists, psychologists and economists assume pride of place.

(15) Entrepreneurship is the most scarce commodity in under-developed economies, Tamil Nadu being no exception. This type of District Survey will serve to identify wherever it occurs and to suggest the proper climate for its rapid growth. Problem-oriented research leads to trouble-shooting, quick-studies. The regional

studies are concerned with every aspect of the economy but are capable of being split up into narrow segment studies with their focus on one or two traits.

(16) The foregoing discussion would have shown the amplitude of research as well as the variety and complexity of the problems: It remains to consider how our Universities and the Research Institutions should set about the job in a meaningful and systematic manner to produce optimum results. The newly established University of Agricultural Sciences has a well defined area to concentrate. As for the rest, a tentative scheme of division of labour and delimitation of the area-spatial and functional may be attempted. The entire State (except certain urban centres) may be divided into three zones and to each University the contiguous Zone may be assigned for conducting District Techno Economic and Sociological Surveys and Man-Power Research, while to the Research Institutions the urban agglomerations of Madras and Madurai cities, Coimbatore and Salem towns.

(17) The Sectoral problems may be assigned to Universities and Research Institutions on the basis of expertise they possess, for example the problems of the Textile industry may be studied by Madras University and problems of marine fisheries by Annamalai University which has an Advanced Centre of Studies in Marine Biology. The distribution of research studies could be arranged by a Standing Committee of Experts from the Universities and Research Institutions which will also coordinate the work, avoiding duplication and unhealthy competition.

(18) Above all there should be coordination among the government, Private Industry and University-cum-Research Institutions. Channels for constant communication should be set up to demolish the bamboo, if not the iron curtain, that separates them today. The dialogue that is bound to be maintained and the ensuing rapport will help a better appreciation of the problems so essential to their ultimate solution. The Government as well as the Private Sector may perhaps argue that they have their own trouble-shooters their own achievement audit their own managerial and technical skill ; they may therefore consider the Universities

and Research Institutions as unwelcome intruders upon their sacred terrain. Eminent their own experts may be, but they will be (a) too busy with routine work to "stand and stare" at problems and (b) too biased to get out of their own rut to see how others would see things. It is in this context that an outside, independent, unbiased expert can scrutinise things without blinkers or tinted glasses and help to diagnose the true cause of the malaise which means half the battle won.

STATE PLANNING COMMISSION AND THE PROPOSED STATE DEVELOPMENT RESEARCH COUNCIL

By

MR. M. G. RAJA RAM, I.A.S.

Deputy Chairman, State Planning Commission

1. *Establishment of State Development Research Council (SDRC):*

The participants of the seminar have come from different walks of life. We have among us academicians, industrialists, heads of Government departments, of public undertakings and of research institutions. The State Development Research Council as proposed by the Seminar has the support of the cross section of the elites. Regarding finance for the SDRC, I would say that it may receive funds from different sources such as State Government, State Planning Commission, Central Planning Commission, University Grants Commission and Private organisations like industries. The Council will assess the importance and needs for studying the problems. After a careful study of the problems to be investigated and their priorities, the Universities, colleges, research institutions may be approached for conducting the studies. It will also channelise funds for undertaking the investigations. It will see that institutions having competence and experts are given projects.

2. The State Planning Commission has identified a number of problems for investigation. These problems have been classified by sectors of activities. The investigation of these problems is considered necessary for framing the plan for Tamil Nadu on a scientific and empirical basis. The problem facing the Planning Commission is locating the appropriate institutions competent to take up these studies. We have a number of eminent scholars, some of them are internationally reputed. I am quite confident and sure that a number of scholars are interested in conducting development research.

3. The third point which I want to emphasise is that there is no need to fear bureaucracy in the administration of all types of institutions—in Universities and colleges, in scientific and technical research institutions, in industry, etc. What we should worry about is the bad bureaucrats.

4. Finally, I should emphasise a very important point. I feel strongly that students in general, Post-graduate students in particular, should be induced to involve themselves in development activities. They should not be kept in the class-room as mere passive listeners. For example, Post-graduate students, individually or in small groups, may be given small problems for study, problems connected with development. Thus, they will have active participation in the learning-teaching process and also they will earn while learning.

SCIENCE AND DEVELOPMENT

By

Mr. G. R. Damodaran

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The theme of today's discussion is on Research and Tamil Nadu Fourth Five Year Plan. I would like to refer to some special areas of research the state of Social Science research, the relationship between users of research and research institutions and research priorities in Tamil Nadu Fourth Plan.

In the developing countries social sciences research competence has begun to be perceived as a critical resource for advancing the process of development. Until recently problems of development had been approached too exclusively in economic and technological terms. Repeated disappointment with the results of plans is creating a new climate for social research. This is characterised by a greater willingness to consider complex interrelations which exist between cultural, psychological, social-structural factors and economic and technological aspects. The ensuing situation confronts social sciences with intensified demands. It is widely felt that, in the decades ahead, social sciences may well assume a leading role in the scientific plans and activities of developing countries.

So far, in our country, efforts to promote such social research as will be useful for policy formulation have met with meagre results, except perhaps in the field of applied economics. This is because the research has been sometimes irrelevant to actual situations and has not been presented in a way which makes its implications comprehensible to policy makers and administrators.

Sometimes ad hoc financing of research makes it difficult to undertake long term planning of research programmes and often forces a research institute to accept projects to which it would otherwise give a lower priority. Where a regular flow of projects is not assured, the institution may be forced to dismiss good staff

members thus losing experience gained previously. It is also time consuming to hunt and wait for money. Furthermore, many types of social research, particularly problem oriented research, usually require a team of research representing several disciplines.

Scattering of research resources in our country is not only due to lack of institutional co-ordination and otherwise of policies towards systematic planning of social research. It is everywhere apparent that the basic information on crucial areas and problems does not exist and that much of the available data is out of date. Even when numerous studies on related problems have been carried out, usually with limited geographical coverage, there is little co-ordination. By far, the most serious problem however is the lack of basic common thinking and co-operation between the user and the researcher, to improve the quality of research and enhance the opportunity for accumulating knowledge.

Relationship between researchers and users of research :

There is also a wide gulf between the way the administrator looks at research and the perceptions held by researchers. The administrator generally faces a problem of current importance to him; he wants an answer, if not now, at least soon enough to be able to influence the decisions he has to make. He wants an answer that takes cognizance of his particular situation and the particular political and administrative problems facing him. This is not the kind of answer which research is normally expected to provide. The researcher typically recasts the problem into a form in which he can tackle it with the tools at his disposal. There tools are the systems of analysis provided by a discipline which he practises. Thus to the sociologist the problem is a sociological one, to the psychologist a psychological one and so on. Thus the actual problem which the researcher is tackling is of a different nature from the problem as it is seen by the administrator.

These gaps in perception and time involved in research create enormous difficulty for the actual application of research in socio-economic activities. These gaps can be narrowed down through mutual inter-action between the user and the researcher. In order to increase the absorptive capacity for social research results,

planners and administrators and technologists should have an understanding of social sciences and their uses. Social scientists, however, must become more skilled (application oriented) in the transfer process from research to application. In this context it is pertinent to quote the Heyworth Committee on Social Studies:

> "In the physical sciences the translation of research findings into practical applications is the function of the specially trained development scientist or engineer, who understands both the relevant scientific discipline and the technology of the establishment in which he is employed. In the social sciences, even when allowance is made for the difference in the nature of applied research, there are few people whose functions correspond to the engineering or development function in the physical sciences, and nowhere are such people trained. If anything approaching the full potential value is to be obtained from research in the social sciences, an attempt must be made to define and analyse this function and train people to perform it. This means that organisations must also be ready to employ them when trained."

Planning and our problems:

Looking back on the achievements under our Plans, we have built vast and complex industrial enterprises. We have successfully initiated a process of transformation of our agriculture and are already near the goal of self-sufficiency in respect of foodgrains. We are spreading literacy and extending medical care. We have also largely created the infrastructure for the development of our technical skills. The achievements have not been by any means meagre and yet there is a pervading feeling of inadequate progress on the part of many sections of the community. Recent political events have thrown into sharp focus the dissatisfaction with the answer to the question of how much has been achieved so far, for whom, and at what cost in our process of planned development. The time has come and the commitment has been given at the time of the last general elections—to rectify the situation by a proper and active implementation of a social and economic programme through democratic processes. It is necessary to keep this overall picture clearly in our mind while formulating the problems for research.

A very important area for research concerns the improvement of our management technique both in private and public sector industries so that quality can be improved and costs can be reduced. In spite of the fact that we have had some major organised industries for decades and in spite of the fact that we launched on an era of planned economic development nearly 20 years back, we are nowhere near ushering in a scientific temper or climate in our industry.

Programme of Research :

Programmes of research have to be evolved both on long range and short range basis involving co-ordinated efforts by universities, Government, public and private organisations. I will briefly outline some of the areas which appear most significant. To begin with we should concentrate on studies that are immediately productive and are urgent. Studies of a basic nature should also have priority. Some of the studies could be :

1. Studies that could assist in minimising existing losses—e.g., investigations pertaining to idle capacity in existing industries enabling the State to evolve policies for fuller utilisation and to prevent further losses resulting from addition of new capacity in these lines of production.

2. Studies that could speed up benefits from committed projects, such as the implications of the Salem Steel Complex. Studies to ascertain about auxiliary industries and infrastructure so as to make feasible their advance planning.

3. Storage and transportation as applied to agricultural production and rural economy.

4. Application and impact of agricultural sciences and technology in agricultural productivity.

5. Studies on social and political regulations in the use of scarce resources.

6. Socio-economic studies of the changing rural society.

7. Location of potential for small scale industries and disposal of industries—area studies to provide guidelines for investment. Studies on employment and unemployment—to identify the nature of the problem so as to select projects of a suitable type.

8. Analysis of manpower requirements in relation to present and potential industries, diversification of educational system, training and vocational orientation.

9. Research on water supply, urbanisation problems and town planning.

10. Population control and the psychological and sociological aspects of family planning.

11. Investigations on resources, their pattern of utilisation, future projections at district and local level; power and water resources, minimisation of cost of energy and elimination of wastes in energy.

This is by no means a comprehensive list; but even this list is sufficient to show the extent of interplay between experts in different disciplines that is necessary if realistic solutions are to emerge.

Challenging Task :

The increasing rate of change and the degree of uncertainty and of environmental complexity characteristic of the contemporary world is forcing societies to collect more accurate information about their populations, institutions and individual members, the trends and levels of their economic and social performance and to seek to know more also about other societies. The collection of social and economic facts has, however, tended to be left to governmental departments slow to make use of the latest techniques.

The first problem is to close the gap between existing practice and available concepts and methods. This means either changing

the relation between official bodies and sources of social science competence in universities and special institutes or bringing new and more appropriate organisations into existence. The second problem concerns the extent to which general-purpose social and economic data are made public.

The function of collecting and analysing social and economic data can be most effectively executed and most rapidly developed if it is made the responsibility of institutes under the control of social scientists appointed by joint agreement between government, the universities and the professional associations. Government departments would be the principal, but by no means the only clienteles of such institutes. They would have their own internal specialists to interpret findings and carry out special purpose analyses. But such institutes also would have the power of initiating inquiries—to assist in building up the corpus of knowledge required to provide a public basis for taking informed social action in all domains of a society.

Some of the technical problems in this field are formidable. Data are required over long time periods, but concepts and methods are continuously improving and the foci of investigation continuously shifting. To obtain desired comparisons often proves impossible. A strategically planned attack on such difficulties on a scientific rather than an administrative basis would obtain solutions improved far beyond what is at present deemed feasible.

Environmental pollution control :

1. The fast development of industry and concentration of population in cities, have created serious social problems due to so called public hazards including pollution of air, contamination of water and noise.

To nuisances, have been added new types of environmental phenomenon like industrial waste, etc.

Studies and research must be undertaken to tackle such problems and steps must be taken for the establishment of anti-pollution structure for the prevention of such public hazards.

2. *Energy-management*—Electrical industries from hydro and thermal and other fuels—New sources of energy—nuclear—Research to bring down the cost of energy and of production and transmission elimination of wastages.

3. *Research* : On problem of medium of instruction—in our Educational System.

UNIVERSITIES AND RESEARCH

By

MR. N. D. SUNDARAVADIVELU,

Vice-Chancellor, University of Madras.

In a developing country, the preoccupation of most of us with our own day-to-day work is so much that we have so little leisure to get together, and discuss mutual problems. Besides, when it comes to industrial development in India, we know that several problems arise from considerations of raw-materials, manufacturing processes, work-force and prices of goods. When a complex subject which has so many facets faces us an attempt to organise research to understand the various factors often results in providing temporary palliatives. It has been pointed out by the participants in the Seminar that industries and business houses should pay more attention to research. I welcome this suggestion because this is a practice ..which is obtaining in other countries, & much good has accrued therefrom. However, the finances of universities and research institutions are still inadequate for the purposes of teaching and research and the support, financial and otherwise, that business and industry can make available to centres of learning would be very welcome and one can be assured of social returns in a great measure.

The graduates and research workers in diverse fields who are given facilities for undertaking research on various projects are intended to serve the different sectors of the economy, viz., agriculture, industry, trade, Government and the professions. Whatever investment is made by the universities and other research institutions is utilised to prepare candidates for the service of the nation taking into account the totality of activities.

Today, we look forward to hearing the gist of the conclusions arrived at, at the Seminar during the last two days. I have no doubt that the programme of three-year research priorities in

Tamil Nadu development will, when implemented, help our State to achieve much progress. We all appreciate that development is a comprehensive term, it covers not only economics but also several aspects of education, society and related issues.

I find from the programme circulated that many businessmen and industrialists have contributed background papers and addresses. It is necessary for us to know from our industrialists, businessmen, traders and agriculturists their respective points of view, and the way they view the problems of research, in humanities and sciences, with a bearing on economic development.

While this particular urge has been there with universities for a long time to meet the changing needs of society, there is an increasing awareness in recent years because of the high tempo of modernisation of the economy that we are now experiencing. During the first, second and third Five-Year Plans, the University personnel were drafted by the Research Programme Committee of Planning Commisson of India and given assignments on a number of subjects. In our own University of Madras, the Economic Survey of the City of Madras was launched under the R.P.C. Programme. It is one of the pioneering studies of the City economy in India. The study examined the various activities in the City which have a bearing on the development of the State of Tamil Nadu, and the rest of South India. Similarly, universities in South India have been engaged in problems connected with housing and rent control, agriculture and production, cost of living and industry, and its implications, fixation of salaries and allowances, besides the problems of rates of interest and financing co-operatives. But all these studies have remained so far largely academic because of the fact that the scholars have worked in a spirit of detachment, and perhaps with a measure of isolation.

A new philosophy that informs society and that is in keeping with the ideals of scholastic detachment, is that now it is possible to go to the masses to enlist the support of industries and business and to engage in scientific thinking and pursuits for the benefit of the masses of the country, depending upon the kind of demands they make.

We know, how for instance, when a question of the European Common Market arose for popular discussion, the Universities in Great Britain became involved in assessing the fundamental issues hitherto unnoticed by the busy men in day-to-day administration and public affairs. Similarly when Lyndon Johnson declared War on Poverty as the plank of his economic policy, many universities in the United States took to basic research on the Concept of Poverty and Methods of minimising its vigours. In those countries, the people have looked to their univeristies in an increasing measure for help and guidance and the universities have responded in their own characteristic way. Times are not far off when Indian Universities will have an increasing association with Governments and Industries and other Institutions so that both will benefit by their distinct services to the society. When it is a question of discovery like Dr. Khorana's Genetic Code or Dr. C. V. Raman's discovery of the nature of light, the benefits are available to humanity as a whole. For such fundamental discoveries, however, scholars require a measure of independence. The sympathy and understanding of the community in giving them leisure and freedom of action is therefore quite necessary- Exciting developments have taken place in science and technology and if we are to keep abreast of the advances taking place in the world, we have to mobilise all the resources available to meet the needs of society.

As between countries, there is a considerable need for exchange of knowledge and borrowing of ideas. The use of atomic fission for generating power and the employment of atomic energy for peaceful purposes has given hopes to all countries in the world for happier living. A Trombay project or kalpakkam project in India is to be viewed in this perspective. The role of the Universities in fostering advanced study and research in new specialities of learning is being appreciated in every quarter of the globe, and co-ordination between higher institutions of learning and research and industry is a sine qua non to see that local tech-

nology is available and the demands for local power is met. There is also need for transfer of knowledge between social sciences and physical sciences and universities are best suited for this kind of research.

The co-operation between institutions of learning and research and industry and business should be a continuing process. Once knowledge and technology have been made available at the academic and scientific level, industrial and business houses could go into the details of the problems of location, the scale of operation and the alternative methods of management and for marketing

A DRAFT THREE YEAR PROGRAMME OF RESEARCH PRIORITY FOR TAMIL NADU

By

DR. MALCOLM S. ADISESHIAH AND PROOF: K. SONACHALAM

Note: This draft was debated and amended. The final decision of the Seminar was published in Issue No. 9 of the Bulletin.

The Seminar on Consumer/User Oriented Research.

I. Organisation

1. *Convened* by the Madras Institute of Development Studies in co-operation with the Indian Council of Social Science Research to establish a three-year programme of research priorities in Tamil Nadu development,

2. *Meeting* in Presidency College, Madras on September 17, 18 and 19, 1971.

3. *Comprising* managers from the public and private sectors, Secretaries to the Development Departments of the Government of Tamil Nadu, and research specialists from the five Universities and two research institutes in the State,

II. Findings

4. *Having* engaged in a wide ranging exchange of views on the problems faced by the public and private sector enterprises and laboratories and the development departments of the Government in the execution of their work programme and projects,

5. *Having* also examined the major sectors of the Fourth Five Year Plan of Tamil Nadu from the point of the research studies that need to be undertaken in order to assist in the attainment of their targets, to indicate alternative lines of action, to overcome bottlenecks and obstacles to plan execution and to assemble, analyse and interpret data which are needed or non-existent for plan implementation,

6. *Asserts* as its major finding that research studies oriented to meet the needs of Tamil Nadu development as set forth in its Fourth Five Year Plan are essential for the Plan's successful execution.

7. *Notes* with regret the general situation with regard to such development oriented research in Tamil Nadu which includes the following features:

(a) the absence of integral relations between the research resources and specialists in the Universities and the industrial and agricultural community of workers, managers and departments involved in development work.

(b) the concentration of University research either on fundamental studies or on such micro problems as are unrelated to concerns of the consumers of research in industry, agriculture and Government,

(c) the absence of research interests and programmes in industry in the State in both the private and public sectors, which continue to rely on foreign technical assistance and technology and the absence of financial resources from Industry and Government allocated to research,

(d) the limited financial resources available to the research and development programmes of the Union Government and the bureaucratic structure, nature and control of its administration.

III. Recommendations

8. *Believes* that a continuing dialogue is necessary between research specialists in Universities, national laboratories and research institutes and industrial and agricultural leaders and workers and government departments,

9. *Invites* the universities, affiliated colleges and research institutions in the State to devote a part of their research talent and resources to the work on the themes established at the seminar by the community of business managers, government officials and research specialists, without impairing the fundamental research vocation of the universities and their affiliated colleges.

10. *Requests* the Union Ministry of Planning, Science and Technology and the State Ministries of Finance, Industry, Agriculture and Education to provide for increasing financial allocation for research and development programmes, particularly in the Fifth and Sixth Plans so as to amount to 1% of the National and State Income and to reorganise the administrative structure of research in National and State laboratories in accordance with the report of the Sarkar Committee.

11. *Urges* large business units operating in the State in the public and private sector to set aside 5 per cent of their gross expenditure for their research and development work to be undertaken by them or contracted with the universities and research institutes in the State and the Country.

12. *Suggests* that each development department of the State Government establish a research cell to study and identify problems which need research and which can be undertaken by the universities and research institutes in the State and the Country.

13. *Further suggests* that industrial, commercial and agricultural undertakings refer problems that need study to the universities and research institutes as appropriate.

14. *Reaffirms* the recommendations of the seminar on the role and functions of the ICSSR held at Madras University concerning the urgent need to establish a documentation and data processing centre in the South.

IV. A three-year Programme of Research Priorities

15. *Identifies* the following three-year programme of research priorities in Tamil Nadu Development which should be investigated as far as possible before the expiration of the Fourth Five Year Plan in 1973-74; and the balances of the themes in the succeeding years.

A. General.

1. Ideological socialism and State Capitalism.
2. Social and cultural traits of Tamil culture impeding growth and development.

3. Gap between targets and achievements.

4. Growth rate of Tamil Nadu.

5. Alternative strategies and techniques for Tamil Nadu development.

6. Status of research in universities and research institutes in the State.

7. Techno-economic survey of the State.

8. Techno-economic survey of Dharmapuri and Ramanathapuram and other districts established as backward.

9. Feasibility studies on the new industries proposed in the Fourth Plan.

10. Operations research and systems analysis as applied to
    (a) sale-cum-production and capacity utilisation of Tamil Nadu industries,
    (b) transport services in ports, air-ports and roads in the State,
    (c) co-ordination of Central and State Planning.

11. Regional resource surveys of water and minerals.

12. Tamil Nadu trade relations with South and East Asia.

13. Inter-State Trade movements,

14. An Income/Price policy for the State.

15. Consumption patterns in different regions of Tamil Nadu

16. Family budgets in major industrial centres.

17. Market study and analysis of consumer spending and income distribution in the State.

18. Improving the conditions contributing to man's psychological and social development.

19. Improving the conditions contributing to man's physiological health, nutritional status and development for maximum work efficiency and economic productivity.

20. Optimum use of Tamil Nadu labour in relation to development of agriculture, industry and commerce in Tamil Nadu.

21. Impact of transport costs on industrial growth and agricultural development.

22. How research can become an input in the public and private sector.

23. Model building and use as a means of deciding priorities for Tamil Nadu development.

24. Data processing and computor programming.

25. Producer-cum-consumer research.

B. Industry.

1. Cost reduction in cloth industry.

2. Consumer needs and preferences for specific characteristics in textile products including style, and level of performance and maintenance.

3. The problems of sick textile mills.

4. Establishments of standards for clothing sizes through research on anthropometric measurements and progressing of all segments of the population.

5. Operative efficiency of the sugar industry and the optimum cane growing area.

6. Steel planning and the Salem Plant.

7. Marketing of hosiery products from Tirupur.

8. A foundry research institute in Coimbatore.

9. Demand forecasts for auto-spare parts.

10. Economics of a Tamil Nadu Corporation for buffer stocks of industrial raw materials and spare parts.

11. Nutrition base of pharmaceutical products.

12. Commodity studies (industrial gap) in:
    - *Electronics
    - * Plastics
    - * Fine Chemicals
    - * Dyes.
    - * Tobacco
    - * Oil
    - * Silk
    - * Cashewnuts.
    - * Leather
    - * Light Engineering Goods.
    - * Heavy Engineering Goods.
    - * Paper
    - * Linkages between auto, cycle and radio industries.

13. Cost estimates and cost control of public sector undertakings.

14. Economic evaluation of Neyveli.

15. Ancillary industries around Neyveli.

16. Ancillary industries around Salem Steel.

17. Economics of Modern Rice Mills.

18. Slow rates of expansion of electricity intensive and chemical industries.

19. Bench-mark survey of Tuticorin complex.

20. Bench-mark survey of Salm-Neyveli complex.

21. Problem of unsold stock of handloom industry.

22. Power-looms and their impact on wages, employment, and productivity and finance.

23. Industrial estates in relation to the objective of promoting growth centres in backward regions.

24. Industrial Estate for electronic industries at Adyar.

25. Export oriented industries of Tamil Nadu.

26. Survey of problems of major cottage industries.

27. Substitutes for scarce industrial raw materials, steel cotton and copper.

28. Industrial specialisation between States.

29. Location, transformation, restructuring and dropping of industries in Tamil Nadu.

30. The role of the entrepreneur in the engineering industry.

31. The role of the worker-manager.

32. Economic management, time scheduling and administration of public sector industries in Tamil Nadu.

33. The place of the economic calculus in public sector undertakings.

34. Casteism and communalism in public sector undertakings.

35. Consumer goods industrial policy.

36. How far is the I.S.I. effective in the standardisation of consumer goods.

37. Problems in consumer education.

38. Appraisal of the Institutional basis of Industrial Finance in the State.

39. A technology map of Tamil Nadu.

40. A revised employment oriented industrial programme for the State.

41. Research personnel needs of Tamil Nadu industries.

42. Impact of Research and Development on Industrial output.

43. Evaluation of industrial research and patents and their commercial exploitation.

44. The communication gap between research institutions and industry.

45. The place of indigenous and foreign technology in the State's Industrial Development.

46. Economics of retail distribution.

47. The impact of the licensing system in Tamil Nadu Industries.

C. **Agriculture.**

1. The place of middle men in the agriculture industry.
2. Mobilisation of rural savings through taxation and institutionalisation.
3. Rural underemployment studies by blocks and districts.
4. Economics of high-yielding varieties—paddy, pulses, sugarcane and cotton.
5. Economics of minor irrigation works.
6. Impact of irrigation on cropping patterns, land utilisation and agricultural investment.
7. Utilisation and pricing problems of irrigation in the Thanjavur district.
8. Planning and Development of growth centres.
9. Impact of highyielding variety on small and tenant farmers.
10. Highyielding variety areas and agricultural indebtedess.
11. Economics of dry farming technology by crop and area.
12. Economics of horticulture—grapes, bananas, mangoes and coconuts.
13. Cement flooring device and rice cultivation in Trichendur.
14. Tractorisation in Thanjavur and Coimbatore.
15. Appraisal of Tamil Nadu forest resources and policy.
16. Economics of dairy and milk supply in urban areas.
17. Economics of development of cattle, sheep, poultry and piggery.

18. Development of Fisheries in Tamil Nadu.
19. Warehousing and marketing.
20. Economics of Bhoodan movement and Land Ceiling Act of 1961 and 1971.
21. Economics of Co-operative Marketing Societies.
22. Institutionalisation of credit to the small farmers.
23. Consumer Co-operatives.
24. Land Development Banks.
25. Appraisal of Community Development in the State.
26. A soil Atlas for Tamil Nadu.
27. Rural Public Works in dry farming and irrigated areas.
28. Agrarian tension in Thanjavur.
29. Role of rural institutions, panchayats, co-operatives, etc. in stimulating agricultural development.
30. Effectiveness of different media of communication in spreading innovations among cultivators.
31. Evaluation of working of Small Farmers Development Agency.
32. Economic Surveys for introducing crop insurance and cattle insurance.
33. Evaluation of State Farm Schemes.
34. Variation and behaviour of agricultural prices in the State.
35. Influence of price variations on cropping patterns.
36. Economics of foodgrains procurement.
37. Procurement levy and marketing of agricultural products.
38. Terms of trade of Agricultural inputs and outputs.
39. Management problems in the plantation industry.
40. The terms of trade between agriculture and industry during the three Tamil Nadu Plans.

D. Education :

1. Social cost of wastage of education at various levels.
2. Job oriented rural education.
3. Vocationalisation of secondary education.
4. Input-output tables of higher education.
5. Survey of utilisation and optimisation of public and rural libraries.
6. Cost of adult illiteracy.
7. Economics of educational technology for the State.
8. Survey of education of scheduled and backward classes.
9. Unit cost of education at various levels.
10. A science plan and policy for Tamil Nadu.
11. Education and training needs for the Fifth and Sixth Plans of the State.
12. Role of youth and students in State Development and planning.
13. Sociology of Education in the State.
14. Out of school education and training as a complement and substitute for secondary and post-secondary education.
15. Continuity and innovation in Tamil Nadu Education.
16. Quantitative expansion and qualitative excellence in Education.
17. Guidance and counselling services.
18. The learning process.
19. Mobilisation of public resources for education in the State.
20. Educational management in Tamil Nadu.
21. Comparability and comprehensiveness of educational statistics.
22. Education as a means of democratisation in Tamil Nadu.
23. Evaluation of and priorities in Tamil Nadu Education.
24. Manpower units in universities and Colleges to guide student specialisation.
25. Search and reward of talent.
26. University and College management.

27. Typology of University and College research in Tamil Nadu.
28. Universities as focus of renaissance of fine arts and music.
29. Universities and Colleges as training ground for Tamil Nadu industry and agriculture.
30. Research on documentation.
31. Tamil Nadu needs for integrated programme of health, family planning, recreation and community welfare education.
32. The absence of education research in Tamil Nadu.
33. Problems of brain drain in Tamil Nadu.

E. Employment.

1. Forecasts of manpower needs and resources in Tamil Nadu.
2. Study of agricultural wage trends.
3. Rural-urban migration.
4. Wage differences, productivity and conditions of service.
5. Labour unrest in the public sector.
6. Educated unemployment in the State.
7. Projections of needs for medical, engineering and agronomic personnel for Fifth and Sixth Plans.
8. Rural Public Works, employment and the Fourth Plan
9. Employment generation in the Fourth Plan.
10. Surplus labour in the rural areas by blocks and districts.
11. Impact of modernisation of agriculture on rural employment.
12. Self employment-possibilities and prospects in Tamil Nadu.

F. Health and Family Planning.

1. Evaluation of Family Planning measures by development blocks and districts.
2. Massive production of food at appropriate nutritional levels.
3. Case studies of birth rate reporting and registration.
4. Case studies on attitudes, motivations and preferences with regard to family planning.

5. Relationship between better health and fertility control.
6. Social and religious values and family size.
7. Reproductive physiology, contraceptive technology and the ideal contraceptive.
8. Biological and psychological effects of sustained use of contraceptives.
9. The Cochin Vasectomy project and its lessons for Tamil Nadu.
10. Alternatives to Family Planning.
11. Analysis of date on Family Planning available in the Department of Health and in the Blocks.
12. Causes for dropout in diptheria control programme.
13. Differential attitudes to abortion.
14. Emotional and health implications of abortion.

G. Fiscal and Credit.

1. Incidence and growth rates of various taxes.
2. Study of savings potential, growth rate of savings propensities and disincentives to save—means of mobilising new fiscal resources.
3. Capital gains tax as supplement to wealth tax.
4. Agricultural income-tax.
5. Incidence of road transport taxation.
6. Study of fiscal resources of Panchayats and Panchayat Unions.
7. Effect on consumer spending and small savings of abolition of prohibition.
8. Excessive emphasis on indirect taxation and its effect on growth.

H. Power.

1. Power rating and distribution efficiency of electricity undertakings by licensees.
2. Techno-economic survey of rural power transmission and distribution.
3. Inventory and stores control in the power industry.
4. A material cost index for the Electricity Board.

5. Productivity augmentation due to lift irrigation by electricity.
6. Problems of costing in the power industry.
7. Inter-State power grids.
8. Inter-State river linkages.
9. Provision of cheap power and alternative sources of energy.

I. Housing and Public Works.

1. 1980 projections of Housing requirements, urban and rural.
2. Rent control and urban housing.
3. Manpower needs for Housing programmes.
4. Master Plans for urban centres of the State.
5. Housing construction for the Low income Group.
6. Land acquisition and development for building sites.
7. The Mahalingam Plan for urban development.
8. Problems of Industrial Housing.
9. Problems of suburbanisation.
10. Economics and sociology of slum clearance.
11. Model House designs adapted to local conditions and materials.
12. Housing as symbol of social status.
13. Development of new concepts of space, with emphasis on storage, task performance, leisure activities and anticipated technological changes.
14. Impact of single type neighbourhoods on socialisation of children.
15. Improving the health and sanitation aspects of housing.
16. Time Study on labourers engaged in building work.
17. Financial allocations for home making.
18. Roads as infrastructure and as a means of employment generation.

J. Welfare.

1. Pollution in Madras City.
2. Environmental pollution in Tamil Nadu.
3. Beggar relief and rehabilitation.
4. Impact of welfare programmes for Backward Classes.
5. Varying rates of progress of Backward Classes.
6. Restraints on conspicuous consumption.
7. Unemployment relief.

8. A State-wide programme of low priced supply of rice, cloth and Kerosene for the urban and rural poor.
9. Improving the quality and availability of community services which would enrich family life.
10. River sanitation.

K. Nutrition.

1. Economics of mal-nutrition and cost of nutrition.
2. Nutrition and productivity.
3. Nutrition and working efficiency.
4. Nutrition and family size.
5. Nutrition and learning abilities.
6. Assessment of economies and nutritional impact of the sponsored programmes, school lunch, A.N.P., infant, pre-school and other feeding programmes.
7. Development and evaluation of food supplements.
8. Effects of food processing and packaging methods on food quality, nutritive value, safety, cost, acceptance in homes and catering institutions, and economics of nutrition.
9. Determining consumer needs and desires for new foods—partially and fully prepared ready to eat—foods.
10. Standardisation of recipes and cooking procedures for catering and aided feeding programmes.
11. Dietary habits and nutritional status.
12. Effectiveness of educational effort, disseminate nutrition information.
13. Economics and nutritional implications—vegetarian vs. non-vegetarian.

V. Action

16. *Invites* the attention of the Universities, affiliated colleges and research institutes in the State to the research themes established in paragraph (15) on which work should be completed in the next three years according to a rigid time schedule and

15. *Points* out the need for a rational distribution of the research themes among the institutions on the basis of their research resources, equipment, expertise and the environment in which they are located along some such lines as :

(a) the Indian Institute of Technology and Engineering colleges and polytechnics and national and State laboratories in the State might specialise on the technological and engineering studies listed under industry, power, housing and welfare,

(b) the Agriculture University and affiliated and related Institutions might work on the research studies listed under agriculture,

(c) the Institute of Techno-economic Studies might undertake techno-economic surveys, feasibility studies, commodity studies, economic revaluation and bench mark studies,

(d) the Madras University affiliated colleges and the Madras School of Social Work might undertake social science studies on Health and Family Planning, the State and inter-State studies listed under the heading 'General', the power problems and industrial studies located in the Coimbatore and Salem complex,

(e) the Annamalai University might undertake the Fisheries study, the social problems of public sector undertakings, the industrial and agricultural themes located in its area, the housing and welfare issues,

(f) the Madurai University and affiliated colleges might specialise the fiscal and credit themes, in the employment and education area and such of the agricultural and industrial studies as are related to its district,

(g) the Madras Institute of Development Studies could deal with studies in handloom and cottage industries, economics of land reform, rural public works and institutionalisation of rural credit and agricultural wage trends,

(h) the Institute of Financial Management could help in the studies relating to industrial entrepreneurship, finance, credit and fiscal problems in the State,

(i) the society of Industrial and Fiscal Economics might study subjects relating to fiscal economics, industrial location in the Southern States, ergonomics and industrial licensing, taxation etc.,

(j) the Associations of Surgeons of India might study the problems of the economics of health, economics of medical practice, family planning, etc.

Alternative to paragraph 16 (a) to (h)

18. *Points* out the need for a rational distribution among all the institutions for attaining the most successful results for this purpose, the research themes may be

(i) classified

(a) district-wise and

(b) discipline-wise

The districts may be grouped into three zones, each attached to each of the Universities on the basis of contiguity.

The discipline-wise classification may be further divided into

(1) Simple

(2) Complex

(3) Technical and

(4) Highly specialised.

(ii) distributed as follows :

Item (1) and (2) belonging to the Social Science, medical and public health and the research themes in these areas may be allocated to the three Universities on the zonal basis; item (1) being mono-disciplinary and item (2) being inter-disciplinary; item (3) may be entrusted to the Indian Institute of Technology, the Agricultural University and other technical agencies such as Central Leather Research Institute, Central Electro Chemical Laboratory, Karaikudi, South India Textile Research Association; while pathology, mycology, genetics, etc., may be given to agricultural scientists and problems like land reforms, finance, marketing, etc., will have to be inter-disciplinary. Item (4) may be entrusted to the three research Institutes in the State which have their own panels of experienced technical consultants, these research themes will be techno-economic studies, benefit-cost valuations, bench-mark surveys and other complex inter-disciplinary studies.

19. *States* that, despite the suggested and illustrative distribution of research work proposed in paragraph (16), the freedom of any institution to choose any theme listed in paragraph (14) remains unimpaired,

20. *Recommends* that the institutions keep the Madras Institute of Development Stndies informed as and when they decide or are requested by Government or business firms to undertake one of the studies,

21. *Further recommends* that the Madras Institute of Development Studies publish such information in its monthly bulletin so that all institutions are informed of the work planned and underway and so help avoid unnecessary duplication,

22. *Calls* the attention of the Indian Council of Social Science Research, the University Grants Commission, the Union Planning Commission and Government of Tamil Nadu and the State Planning Commission to the need to assist in the financing of the Research work that will be undertaken by the Universities and Research Institutes and in some cases contract with them for specific studies in relation to the priority themes established by the Seminar in paragraph (14),

23. *Urges* the government of Tamil Nadu that it allocate one percent of its annual education budget and allot 20 percent basic land revenue collection now amounting to Rs 5 crores (which will involve reconsideration of the proposal to abolish it) in order to finance the development oriented research for Tamil Nadu listed in paragraph 14 on the advice of the machinery proposed under paragraph 22.

24. *Suggests* that the State Planning Commission help in establishing and running a State Development Research Council consisting of research specialists of the five Universities, colleges, the five research institutes, repesentatives of the development departments of State Government and the private and public sector in order to continue the dialogue among research producers and consumers established at this Seminar and to review, revise, up-date and harmonize the development research tasks of the Universities and Research Institutes.